

United States. Circuit Court.
District of New Jersey.

American Graphophone Co.) In Equity No.
versus) 10 on Patent
National Phonograph Co.) 606,725

Various Briefs and Arguments
for Defendant

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IN THE
Circuit Court of the United States

DISTRICT OF NEW JERSEY.

AMERICAN GRAPHOPHONE COMPANY,
Complainant.

vs.

NATIONAL PHONOGRAPH COMPANY,
Defendant.

} In Equity.

Brief for Defendant.

FRANK L. DYER,
MELVILLE CHURCH,
for Defendant.

PRESS OF W. F. ROBERTS COMPANY, WASHINGTON, D. C.

IN THE
Circuit Court of the United States

DISTRICT OF NEW JERSEY.

AMERICAN GRAPHOPHONE COMPANY } In Equity.
vs. } On Macdonald Pat-
NATIONAL PHONOGRAPH COMPANY. } ent No. 606,725.

BRIEF FOR DEFENDANT

The phonograph as originally invented by Mr. Edison in the year 1877 employed a sheet of impressible material, such as tin-foil upon which indentations corresponding to sound waves were recorded. The improvement of Bell and Tainter, patented by them in 1886, consisted in cutting or engraving the sound waves in a wax-like material. From these early days—except for a brief space when a truce seems to have been made—the phonograph and graphophone interests have been opposed, both commercially and in numerous litigations based on patents. On the one hand, have been the Edison Phonograph Works, the Edison Manufacturing Company, and the National Phonograph Company, which are generally referred to as the Edison Companies; and on the other, the American Graphophone Company and the Columbia Phonograph Company, which are generally referred to as the Graphophone Companies. At the present time the phonograph and the graphophone are very closely allied machines, and, in fact,

they embody the same patents to a certain extent by virtue of a mutual license of December 7, 1896 (Record, pp. 443-447) to which reference will hereafter be made. But in the year 1888 the two machines were widely different and this was especially true of the recording tablet or blank upon whose surface the sound waves were to be cut or engraved. With the Edison phonograph the blanks in that year were, so far as their physical form is concerned, substantially the same as now, being cylinders with relatively thick walls and tapering bores, adapted to be held frictionally on a mandrel, and capable of being shaved off a number of times, so as to permit successive records to be formed on the same blank. With the graphophone, however, the blank was composed of a paper tube carrying a thin coating of wax-like material on which a single record only could be made. Dodge states that these differences existed between the blanks of the two concerns as late as 1892 or 1893 (Record, p. 356, Q. 13). In an affidavit, executed by Mr. Dodge on November 27, 1894 (Defts. Exhibit Dodge Affidavit), he said:

"At the time that I commenced my experiments at Bridgeport on graphophone cylinders—that is to say, on or about April 12, 1893, the American Graphophone Company had in use and on sale a single type of cylinder for the recording and reproduction of sound. This cylinder was composed of a paper tube, coated with a thin, flexible and soft layer of ozokerite wax. In some instances this wax contained an admixture of paraffine.

"The graphophones, in connection with which these cylinders were used, were found decidedly objectionable by users for various reasons, among which were, that the wax with which the paper tube was coated was quite soft, and owing to this the point of the recording style was dulled, probably from impurities in the ozokerite; and that also, owing to the use of the soft wax, the material was not cut sharply from the groove, but was

permitted to tear, under the action of the style, whereby the record groove was made rough, and this conduced to a confusion of the articulate sounds. Added to this the material clogged up the style, thus increasing the confusion of the sounds. Another objection, and one found very important in the use of these cylinders, was that owing to the softness of the material, the minute elevations and depressions in the sound groove were readily leveled off by the action of the reproducer passing thereover; that is to say, the material did not have sufficient stiffness to withstand the rubbing action of the reproducer as it passed through the groove for the purpose of reproducing sound from the record therein. Furthermore, with these cylinders it was impossible to record and intelligibly reproduce the hissing sounds so common in speech. These objections were well recognized and understood at the time I refer to, and experiments were carried on continuously for the purpose of avoiding them."

On the other hand, the material used with the Edison blanks was not very much better. Wangemann says:

"The phonograph blanks used at that time were of a light yellow sticky wax mass, not very thick in diameter." (R. p. 224-5.)

* * * * *

"The yellow wax being soft and very sticky" (Q. 6).

Obviously the art required a better composition, one that could be cut readily by the delicate recording stylus, that would be as hard as possible to resist wear of the reproducer stylus, that would be extremely smooth, so as to eliminate foreign noises, that would be perfectly uniform and amorphous, so that the cutting action of the recorder would be the same at all times, and, finally, that would be perfectly stable so as not to change or deteriorate under climatic and atmospheric influences.

DEVELOPMENT OF THE RECORDING COMPOSITION.

The work of developing the recording composition was entrusted very largely to one of Mr. Edison's assistants, J. W. Aylsworth, then a young man under twenty, whose note-books have been introduced (Defendant's Exhibits: Aylsworth Note Book No. 564; Aylsworth Note Book No. 565; Aylsworth Note Book No. 1000; Aylsworth Note Book No. 150, and Aylsworth Note Book No. 533), which we commend to the Court as a monument of unflagging and persistent industry. His deposition which appears in this case warrants us in referring to him as unquestionably the ablest man today in this particular art. The work was commenced in January, 1888 (R. p. 47, Q. 5). The first 708 experiments made between that date and March 20, 1888,

"comprised chiefly an admixture of natural waxes, gums and resins in various proportions, together with some miscellaneous experiments on treating carnauba wax to partially saponify it, and mixing the same with ceresin; experiments with natural asphalt, and some few experiments on crystallization."

(R., p. 50, Q. 15).

Under date of May 27, 1888 (Q. 16) the following experiment was noted:

"No. 739 Metallic Salts of Fatty Acids. Oleic acid is saponified by 1-6 of its weight of Lewis Lye, and the resulting soap dissolved in hot water and precipitated by excess of a solution of acetate of lead, the precipitate washed, dried and fused.

"Result was a very amorphous, plastic, translucent brownish, waxy mass, which very much resembles crude Japan wax. When mixed with carnauba in the proportion of 100 of the oleate to 30 carnauba, it formed a very good phono wax, non-electric, and with very little scratch, very heavy shaving. Very encouraging, as it gives an opening to a new and promising field."

Concerning this experiment Mr. Aylsworth (p. 51, Q. 16) says:

"I recall the experiment very distinctly, because it marked the starting of experiments in an entirely new line. Heretofore experiments had been limited chiefly to natural waxes and materials of a wax-like nature. This experiment opened up a new field, *whereby artificial wax-like materials were made*. The success of this experiment was instrumental in making a whole series of similar compounds. It was reasoned that if a solid wax-like material could be made from oleic acid combined with lead, materials of any desired properties might result by a similar combination of a fatty acid with lead and other metallic bases."

The formation of this artificial material, chemically referred to as a metallic soap, was the foundation on which the recording composition was based. Further experiments were made with other oleates (p. 52, Q. 22) and corresponding metallic soaps were produced in which palmitic acid was substituted for the oleic acid, resulting in the formation of metallic palmitates (R. p. 53, Qs. 24-26). These metallic palmitates were superior to the corresponding oleates

"but the palmitic acid, as such was rather expensive, and none of those compositions were adopted" (R. p. 54, Q. 27).

Following the experiments with palmitic acid, the several metallic *stearates* were produced by the substitution of stearic acid (p. 54, Q. 29). In all of the experiments so far referred to, the material obtained was a soap formed by saponifying a fatty acid (oleic, palmitic or stearic) with caustic soda and precipitating the same by a metallic salt, such as acetate of lead or aluminum, the reactions being explained by Mr. Aylsworth (p. 51, Q. 18). Although he was on the right track, none of the metallic soaps so far produced by him was of itself suitable for the purpose. A brief

departure from the fatty acids was therefore made and experiments were conducted on so-called neutral fats, such as cocoanut oil, palm oil, cotton seed oil, and peanut oil. (R. p. 57, Q. 36). As a result of these experiments, a very important observation was made which is of especial interest in this case:—

“A serious obstacle was here found in all cylinders made of cocoanut oil, palm oil, cotton seed, and in fact all of the oils and fats, in the shape of minute bubbles, which could not be seen by the naked eye, but could be very distinctly heard in the phonograph as a crackling and scratching noise, and could be seen under the microscope. These were found after a series of experiments to be caused by *glycerine decomposing slowly*, while the wax is melted, giving off acrolene and water, also to the vaporization of the glycerine. It was found that glycerine always occurred in the wax unless it was especially well-made and washed with alcohol after precipitating or other processes, which would make it too expensive for practice. The point at which the bubbles formed could be raised by heating the melted wax very hot and letting it settle and then to the temperature required in molding. But this operation spoiled the quality of the wax and then great care had to be taken to run it high enough each time, and not to let it get too high in molding, which altogether made it impracticable, *so the only way left was to use fatty acids and not neutral fats or oils.*” (R. p. 57, Q. 37).

The date of this observation was August 31, 1888, and its important bearing on the case resides in the discovery made at that time, that the presence of glycerine, either alone or as it appears in neutral fats and oils, is fatal to successful operation; and in view of this fact, Mr. Aylsworth again turned to the fatty acids, of which stearic acid was the most promising, on account of its cheapness. The next step in the development is explained (p. 59, Q. 43) by Aylsworth:

"The notes are as follows:

'Stearate of Soda.

Made by adding dissolved caustic soda to melted stearic acid. It must be added slowly to the acid, and after same is added the higher stearate formed *is allowed to dissolve in the stearic acid*, more heat being applied as the melting point of the mass raises or as more soda is combined with the stearic acid.

To 1000 grams of stearic acid

About 100 grams of Na HO (Lewis) was used.

This makes a soap of a light brown color with a very high melting point, which when poured out and cooled becomes amorphous on the cooling surface, but crystalline on the inside. It is almost perfection on the phonograph (the amorphous outside) as far as articulation, cut and scratch are concerned, but when the cooling surface has been cut through it becomes scratchy and no good, also will absorb moisture on hot damp days, which would spoil any record put on it.'

This composition is different from other soda soaps previously made in that it is an anhydrous soap, in which the saponification was carried to a point somewhat lower than complete saponification. I should say roughly, that the saponification was carried to a point of about 70 per cent of the complete saponification. Had it been carried to complete saponification *it would have been impossible to have melted the product without charring or burning.* The product as obtained gave great promise because of fine record making qualities which the material possessed, but it had this objection that *it was very crystalline* and it was only with great care that enough amorphous surface could be obtained to take the record on in order to test. I remember, however, that this material was far more easily molded than previous compositions, and that if these difficulties could be obviated (I refer to the crystalline properties) that it might make a very promising material."

The difference between this metallic soap (stearate of soda) and those which had been previously formed (such as

oleates, palmitates or stearates of lead, etc.) was two-fold: First, instead of forming the metallic soap by saponifying a fatty acid by caustic soda and then precipitating, by a metallic salt, the resulting oleate, palmitate, or stearate of soda, a single reaction was performed, the stearic acid being saponified by caustic soda to produce stearate of soda which, of itself, is a metallic soap. In other words, the metallic soap selected was the intermediate product formed in the earlier experiments. In the second place, instead of completely saponifying the stearic acid, it was only partially saponified so that a considerable proportion of free stearic acid remained in the mixture, and by reason of which it was capable of being melted without charring or burning. This observation of the utility of partially saponified stearic acid, or, in other words, a mixture of stearate of soda and stearic acid, was of the greatest importance in the art because it is upon this material that the successful recording composition was based, and it is this material which has ever since been used in the art and which is apparently indispensable in any composition on which a successful phonograph record can be made. It will be observed that although Mr. Aylsworth regarded stearate of soda as "almost perfection on the phonograph," he refers to its *crystalline* character, which, of course, if encountered on the recording surface would be fatal. The attempt was, therefore, made to correct this tendency to crystallization, and under experiment No. 858 (R. p. 61, Q. 47) a formula is mentioned, in which the stearic acid is partially saponified by caustic soda lye *in which acetate of alumina was dissolved*, followed by the statement that:

"The object of this experiment is to take the crystallization out of the stearate of soda and to make it mold better. It came out bang-up, non-crystalline, good cut, molded first class but was electrical. Not so likely to absorb moisture."

As to what takes place with this formula, Mr. Aylsworth (R. p. 62, Q. 48), says:

"The reactions which take place on mixing the caustic soda and the acetate of alumina together with water, produce acetate of soda and *aluminate of soda*. Then when this solution is added to the melted stearic acid, the aluminate of soda is decomposed and stearate of soda and stearate of alumina are formed and dissolve in the excess of stearic acid. The acetate of soda which is contained in this solution is also decomposed, liberating acetic acid, which is volatile and carried away by the steam formed, leaving the stearate of soda as the only product remaining due to the reaction of acetate of soda with the stearic acid."

The experiment to which reference has just been made is of importance in the case for two reasons: first, it discloses the suggested use of stearate of alumina in small quantity for correcting the crystalline nature of stearate of soda. Stearate of alumina, according to Mr. Aylsworth (R. p. 64, Q. 51) is "very colloidal or non-crystalline, and when dissolved in a solvent is very viscid." In the second place, the experiment discloses a suggested process of introducing stearate of alumina into the composition by first forming an aluminate of soda solution and effecting a reaction between the aluminum and soda and the stearic acid. It will be shown that this is not the only process that can be used since for a long time defendant produced stearate of alumina as a separate material and introduced it as such in the composition, but the process is important in this case because it is specifically described and claimed in the patent in suit. Further experiments were made to determine if other metallic salts could not be employed for correcting the crystalline nature of stearate of soda, but it was found that stearate of alumina was best suited for this purpose. (R. p. 67, Q. 53.)

Having decided that a combination of stearate of soda stearic acid and stearate of alumina presented the qualities wanted, further experiments were made with this mixture, one of which, No. 867, is described in the following notes (p. 67, Q. 54):

"Acetate of alumina and Lewis' Lye, are dissolved together in water, so as to make a concentrated solution.

The stearic acid is melted in iron kettle and heated to 240 degrees F., then the solution is added same as in No. 357, the temperature ranging between 240 degrees to start and 380 degrees to finish. This is cooked a day and a half, or until bubbles stop coming. This is intended as a duplicate of No. 858, except a little more soda and alumina is added.

Came out same as No. 858, except a little better. It was a reddish color, due to iron kettle.

This material when cooked at a high temperature (400 degrees F.) is much improved, but is rendered less easily molded, on account of the melting point rising.

This wax seems all right, except if a very deep track is made by the phon needle, it chips out; seems to be a little too much Al. in it."

The above notes describe a complete process for making the composition, an aluminate of soda solution being first obtained by dissolving an aluminum salt in caustic soda, in then adding the solution to stearic acid previously heated to a temperature of 240° F. and in effecting the cooking of the mixture at a gradually increasing temperature until it becomes quiescent. This latter step is referred to in the art at the present day as "foaming off." Reference is also made in this note to the improvement obtained when the heating is carried on at a higher temperature. These facts are all of interest in connection with the present case, as will develop later. Having progressed so far as to select a composition

comprising stearic acid, stearate of soda and stearate of alumina, further experiments were made to determine the proportions of these ingredients giving the best results, and in experiment No. 871, the proper proportions appear to have been reached, since it is referred to in the note books as being "perfection almost" (R. p. 69, Q. 58).

"Having settled on this composition as being all right, experiments were made on molding and filtering the material." (R. p. 70, Q. 61.)

Some time prior to December 6, 1888, this composition was adopted by the Edison Phonograph Works and a large amount made. (R. p. 72, Q. 67.) Under the date last mentioned we find the following note:

"Trouble was found in working No. 871 in Phonograph Works, as it would not turn smooth with the knives we had, and when they did get a good knife it would not keep in good condition long, making it impractical to work." (R. p. 72, Q. 67.)

To overcome this defect it was proposed to add to the composition a material which would soften it a trifle, and oleic acid (red oil) was selected for this purpose. The composition using red oil as a softening ingredient is No. 957, concerning which the following note was made:

"This made everything O. K. and was accepted by Mr. Edison as regular for the time being, or until something better turned up."

From December, 1888, when the red oil or oleic acid was first used to soften or temper the composition until some time in the following summer

"the composition corresponding to the formula of No. 957 continued to be manufactured in the Phonograph Works and was known as 'regular'." (R., p. 75, Q. 75.)

Sometime after May 30, 1889, (the date of experiment No. 1022) the following observations were made:

"No. 1026.—Preventing Regular from being Soluble in Moisture.

It was found that cylinders made from Regular (No. 957) were attacked by moisture of the air. This was a very serious matter as records on cylinders became spoiled and the cylinders that were sent out made of this material had to be called back. At the time No. 957 was introduced it was cool weather and they were not affected, but when the hot moist summer weather came, cylinders exposed to it were badly corroded on the surface."

"No. 1027.—*Oleic Acid*, or rather the oleate of soda formed in the wax *was found to be the cause of wax being affected by moisture.*" (R. p. 76, Q. 7.)

The note above quoted is of interest as a recognition of the undesirability of oleic acid in these compositions and its liability to affect the character of the recording surface. It is important that this fact should be borne in mind because it has a significant bearing on the patent in suit. Following the note just quoted from Note Book No. 565 is the statement that:

"The stearic acid we were getting at the time was found not to be as good as that bargained for; it contains *oleic in considerable quantities*; samples were obtained from Mitchell & Company which were very hard and *free from oleic*.

No. 871 (made from Mitchell's) 100
Ceresin 5."

(R. p. 77, folio 163.)

Concerning this note Mr. Aylsworth (p. 77, folio 164) says:

"This experiment was made with a view of overcoming the before mentioned difficulty. I was familiar with

the nature of ceresin and knew that it was a moisture proof wax incapable of combining with caustic soda to form a soap. Therefore, it occurred to me that this material might replace the oleic acid previously used as a softener and *at the same time improve the material as regards its being affected by moisture.*"

The change from the use of oleic acid as a softening ingredient to ceresin for this purpose obviously resulted in serious inconvenience since the former composition had been marketed to a considerable extent before its defects were brought out by the hot weather of the succeeding summer. Mr. Aylsworth appears to have a vivid recollection of this experience. He says:

"The cylinders were manufactured and shipped from the Phonograph Works, and when the bad effects were noticed these cylinders were recalled to prevent losses occurring due to making records on them. I remember that many records were made on these cylinders in the Laboratory at Orange, where musical records were manufactured for some time, and that these records were damaged from this effect. My memory on this point is very clear because I felt very much discouraged to think that we had gone so far before finding the difficulty; in fact, I saw visions of losing my job." (R. p. 78, Q. 79.)

He further says:

"The surface of the record became dull and etched or rough, so that it was almost impossible to hear the record on account of the noise which this roughened surface made. I recall that the effect was also complicated by a mildewed appearance, which on investigation was found to be a deposit which could be rubbed off. These records sometimes were affected in this way, and sometimes by the roughened surface as before stated, and sometimes by both." (R. p. 78, Q. 80.)

Composition No. 1029 following the above observations was accepted "by Mr. Edison as regular" sometime previous

to August 14, 1889, the date of experiment No. 1055 (R., p. 87, Q. 103). This composition (No. 1029) was the first regularly adopted recording material containing all the ingredients and having all the characteristics of modern phonograph blanks. Its composition has never been departed from, and although it has been made by various processes, its chemical make up remains the same as in the summer of 1889 when it was first produced. Whatever variations there may have been, have had to do solely with slight modifications in proportions, and improvements in the purity and quality of the ingredients used. The work on which Mr. Alyswoth had worked so hard and so persistently since January, 1888, had been crowned with complete success. Hundreds—perhaps thousands—of attempts have been made to better this material since that time, but it has never been improved. It seems to be the ultimate thing for the purpose. Generally speaking the composition which was thus evolved after so much hard and intelligent work comprises the following ingredients:

First: Stearate of soda, which is very hard metallic soap is utilized as the base or foundation. While having many desirable features, it, of itself, is open to the objection that it can not be melted without charring and is very crystalline. Stearate of soda, alone, therefore, would not be suitable because it could not be molded and, even if it could be, its crystalline nature would prevent a satisfactory record from being made upon it.

Second: To reduce the melting point of stearate of soda, a certain proportion of free stearic acid is added to the composition. Generally the amount used is about equal to the stearate of soda. Obviously the stearic acid could be added to the completely formed stearate of soda or the same effect produced by partially saponifying the stearic acid, so that a portion shall remain in a free state.

Third: To correct the crystalline tendency of the stearate of soda the composition contains a very small proportion of stearate of alumina. This has been found to be the material *par excellence* for the purpose, owing to its intensely colloidal or viscid nature.

Fourth: To temper or slightly soften the composition so that the cutting stylus will act upon the same more perfectly, a variable amount of a hydro-carbon ingredient, such as ceresin or paraffine is added. Ceresin (the material originally selected by Mr. Aylsworth) has been found to be especially suited for the purpose, since its non-hygrosopic nature acts to resist any deleterious effect of moisture.

FURTHER ATTEMPTS BY AYLSWORTH TO IMPROVE THE RECORDING COMPOSITION AS FINALLY ADOPTED.

As we have said, composition No. 1029, which was regularly adopted by the Edison Phonograph Works sometime previous to August 14, 1889, has never been changed in its make-up. Variations were, however, made in its process of manufacture. Up to that date, it will be remembered, the process of making the composition consisted in dissolving acetate of alumina in caustic soda lye so as to form aluminate of soda which was then added to the melted stearic acid and cooked at a high temperature, driving off the volatile acetic acid and effecting the several reactions, after which the ceresin was introduced. The first attempt by Mr. Aylsworth was to "do away with the expensive acetate of alumina." (R., p. 79, Q. 85.) To this end it was decided to make the stearate of alumina *as a separate ingredient* and to add it as such to the melted stearic acid, instead of forming it by a reaction with aluminate of soda. This stearate of alumina was therefore manufactured by saponifying stearic acid and precipitating the resulting stear-

ate by means of alum, the latter being a very cheap source of alumina. Mr. Aylsworth explains these reactions (R. p. 83, Q. 90). A number of experimental compositions were made several of which are referred to (pp. 80-81) and, under experiment No. 1046 we find the following note:

"This is an exact duplicate of Regular (No. 1029) and is much cheaper and easier to make. The acetate of alumina being done away with. Accepted by Mr. Edison."

The importance of making this change is explained by Mr. Aylsworth (p. 83, Q. 91) as follows:

"When the stearate of alumina was used in place of the acetate of alumina, there was a considerable cheapening of the product, and also one of the difficulties which we occasionally met with in making the wax was avoided. The difficulty referred to was that which was caused by the difficulty of removing the acetic acid entirely from the wax, which caused mildew effects."

The stearate of alumina thus separately made was referred to as "No. 1 Powder" in order that its identity might not be disclosed as it was hoped that the composition might be kept as a trade secret. Following the improvement in question and under date of August 14, 1889, *carbonate of soda* was employed for effecting the saponification (R. p. 87, Q. 103), concerning which Mr. Aylsworth says:

"This experiment was made to obviate the use of caustic soda solution, which frequently contained impurities and which did not readily filter when used in the strength of solution which we required. Also, with the object of substituting a cheaper material."

In the same answer reference is made to Experiment No. 1057 in which the crystals of carbonate of soda were "powdered in mortar and added to melted stearic acid, little by

little" (p. 87, folio 204), the next experiment referring to the addition of stearate of alumina and ceresin to the partially saponified stearic acid, followed by the note:

"All O. K. Exact duplicate of Regular made other ways, and much cheaper and quicker made."

In the next experiment No. 1059 it was observed that the carbonate of soda crystals can be used "without grinding them up, which makes it cheaper yet." (R. p. 88, folio 206.) The completion of this experiment practically ended Mr. Aylsworth's experimental work for the time being, since no change was made in the process until October, 1895, when new difficulties having been encountered, the problem was again taken up. Sometime between September 16, 1889, and October 24, 1889 (the date of experiment No. 1077), the following note appears:

"No. 1059. Made in Phonograph Works in large kettle (nickel). Came out O. K. and on test the cylinders were found to talk even better than others; not any crackles, which I think were due to acetic acid in the old process." (R. p. 91, Q. 113.)

Concerning the actual commercial manufacture of the composition by the improved alum-carbonate process, Mr. Aylsworth (R. p. 95, Q. 123) says:

"I had charge of the manufacture of the wax in the Phonograph Works, at Orange, New Jersey, from the time it was started until I left the laboratory in January, 1891. During a part of this time I was carrying on the experiments referred to in the note books. The manufacture of experiment No. 1059 was commenced sometime between the dates of September 16, 1889, and October 24, 1889, as appears in note book No. 565 at experiments No. 1068 and 1077. The room in which the wax was manufactured in the Phonograph Works was situated next to the nickel-plating room, which was in charge of Mr. Dodd. There were

a number of kettles situated in mason work in this room, and they were heated by gas burners. As I remembered it, each kettle had a capacity of about 150 lbs. of wax which allowed room for the foaming. It is my recollection that there were six of these kettles placed in a row; a burner was located under each kettle, and a hood was built over the row of kettles to carry away the fumes of the acetic acid which came from the wax and were intolerable before the hood was built."

Of course, with the modified process the hood above referred to would be without utility, but it is interesting to note that the commercial apparatus was equipped for the acetate of alumina process, by which the composition was made previous to the adoption of the alum-carbonate process.

COMMERCIAL MANUFACTURE AT SILVER LAKE.

Sometime after the adoption of composition No. 1059 it became necessary to enlarge the plant and manufacture was, therefore, carried on at Silver Lake by the Edison Manufacturing Company by which the material was shipped to the Edison Phonograph Works at Orange, for molding into blanks. Aylsworth had charge of the manufacture of the material or wax until January, 1891, when he went to Jersey City (p 96, Q. 125). The capacity of the Silver Lake plant was somewhere in the neighborhood of 3,500 pounds per day (R. p. 97, Q. 127). The plant and the process actually carried on are described in detail by Mr. Aylsworth (p. 97, Q. 129). The foaming off was performed at a temperature of about 450 degrees F. (p. 99, Q. 131). On the subject of the continued use of very pure stearic acid (p. 99, Q. 132), he says:

"I had to constantly oppose attempts which were made by the office in Orange, through which our ma-

terial was bought, to purchase other brands of stearic acid than Mitchell's which we used. I recall that after leaving the plant in 1891, such a change was made without my knowledge and they got into serious trouble on account of the same. They had purchased a large quantity of stearic acid from Proctor & Gamble of Cincinnati, which had some of the objectionable features mentioned in the experiment noted; that is to say, glycerine, or undecomposed fats. I was called to Orange to see if I could tell what the trouble was that they were having, and after investigation, found that the trouble manifested itself in the shape of minute bubbles. I at once suspected this to be caused by the stearic acid, and on investigation found such to be the case, and that they were using a different brand, which was the brand of Proctor & Gamble's, before mentioned. The difficulty was overcome by buying Mitchell's stearic acid and setting aside that of Proctor & Gamble, and also the wax made from the same."

When Mr. Aylsworth gave up charge of the Silver Lake plant of the Edison Manufacturing Company in January, 1891, the manufacture of the wax composition was turned over to Walter H. Miller (p. 101, Q. 137). He says that at that time the composition embodied the so-called "Useful Data" formula (p. 100, Q. 134), the purpose of these notes being to reduce the wax formula "to exact terms and quantities of the various ingredients, so that a calculation could be made therefrom in case it was desired to substitute any other material or source of soda or alumina, or, in other words, to make the same composition by any other formula or method" (pp. 92-93, Q. 115-116). Aylsworth also left behind for the guidance of Miller three notes (Defendant's Exhibit Aylsworth-Miller Note No. 1, Aylsworth-Miller Note No. 2; Aylsworth-Miller Note No. 3), which fully explained all of the operations. These notes are not dated, but Aylsworth states that they were turned over to Miller early in 1891. (P. 164, Q. 291-295.)

MILLER'S WORK AT SILVER LAKE.

It is not necessary to consider specifically the work done by Mr. Miller, who succeeded Aylsworth. It is clear from his deposition that his efforts were directed entirely towards the production of the composition and were not scientific or experimental. During his regime (1891-1895) as we will presently show, the composition was made and sold in enormous quantities. He carried on the operations as they were explained to him by Aylsworth, and made no departure or change either in the process or formula. When Aylsworth returned to the work in October, 1895, he found the composition was being made by the same process as in 1890 (p. 108, Qs. 143-4.)

AYLSWORTH'S LATER IMPROVEMENTS.

In October 1895 Aylsworth's attention was again directed to the composition and he was requested to investigate "the cause of black specks in wax and the wax coming dark" (p. 101, Q. 139). In the same note it would appear that this defect was due to the presence of sulphur in the ceresin and a process is suggested for eliminating this impurity. He says:

"I recollect that after overcoming the sulphur difficulty I was again called upon to investigate further trouble as regards black specks in the wax. This was rather discouraging, because I thought the work on eliminating sulphur had solved the difficulty. I next turned to the stearate of alumina as being a chance for introducing foreign material, or rather the specks in the wax, because it being formed of a precipitate and that precipitate being dried in ovens, spread out in thin layers in pans, then when dry the material was mixed with the wax and would introduce any specks or impurities which it might contain. Experiments were then started to see if the wax could not be made without the previous formation of stearate of alumina as a separate ingredient." (P. 103, folios 266-7.)

To this end the attempt was made to use aluminum in the metallic form so as to absolutely remove any source of impurity therein. The first effort to dissolve the metallic aluminum in acetic acid was a failure, but it was found to dissolve readily in a solution of carbonate of soda (p. 103, folio 268). It was observed, however, that when the solution became cold the aluminum tended to separate out (p. 104, folio 270), and therefore a small proportion of caustic soda was used "for the purpose of keeping the alumina all in solution" (p. 107, folio 282). It will be observed that in the so-called metallic aluminum process there was a return to the method as originally carried out when acetate of alumina was used. In other words, by dissolving the metallic aluminum in a caustic soda solution, aluminate of soda was formed, resulting in the production of stearate of alumina by reaction within the composition. At the same time the process was more desirable since there was no problem of the removal of acetic acid to be encountered. The development of the metallic aluminum process is fully explained by Mr. Aylsworth (pp. 104-107), the experiments being relatively few, and relating solely to variations in the proportion of the ingredients. The metallic aluminum process was adopted some time in October, 1895, because lots of several hundred pounds each were made at that time (p. 111, Q. 157). It appears in the record as formula No. 38 (p. 111, Q. 159). The process as carried on by the Edison Manufacturing Company at Silver Lake and later by the Edison Phonograph Works at Orange, is fully described (p. 112, Q. 162; p. 113, Q. 163).

The first use of metallic aluminum was in the powdered form or the so-called aluminum bronze powder, that is extensively employed for coloring radiators and steam pipes (p. 125, Q. 194). To conceal the identity of the material it was referred to by the workmen and billed by the manu-

facturer as "No. 1," and "No. 1 Ingredient" (p. 125, Q. 193). About November 15, 1895, experiments were made with metallic aluminum in the sheet form, but Aylsworth says that it was not used in this form until the composition was manufactured by the Edison Phonograph Works at Orange (p. 125, Q. 195). In this respect Aylsworth is no doubt correct because the first purchase of sheet aluminum by the Edison Manufacturing Company was in June, 1896 (p. 271, folio 938), while purchases by the Edison Phonograph Works of sheet aluminum did not commence until July, 1896, after several lots of the powder had been bought (p. 261, folio 897). Obviously the aluminum in sheet form was very much cheaper than in the powdered condition (p. 125, Q. 196).

RESUMPTION OF MANUFACTURE AT ORANGE.

Sometime in the month of June or July, 1896, the manufacture of the composition was resumed at Orange by the Edison Phonograph Works (p. 124, Q. 187), and since that date until the present time Mr. Aylsworth has had charge of this work in an advisory way (p. 124, Q. 189). The date of this removal is not important but it may be fixed in a number of ways; for example, by the fact that the Edison Manufacturing Company ceased to purchase metallic aluminum after June, 1896 (p. 271, Q. 59), while the first purchase of metallic aluminum by the Edison Phonograph Works was in that month (p. 260, Q. 46).

At Silver Lake actual work in compounding the mixture under the metallic aluminum process was done by Higgins and at Orange by Aschenger (p. 125, Q. 190) who left in 1897 and was succeeded by Dodd (Q. 191). Miller corroborates Aylsworth as to the first use of metallic aluminum (p. 220, Q. 82) but he incorrectly places the date as the latter part of 1894 (p. 219, Q. 80). It was in fact

a year later. Higgins also describes the metallic aluminum process as he carried it on at Silver Lake (p. 477, Q. 19-22). He produces two notes (p. 479, Q. 41) giving slight variations in the formula and in which the aluminum is referred to as "No. 1" (Defendant's Exhibit Higgins Note No. 1; Higgins Note No. 2). These notes were dated March 19, and March 28, and the year can be definitely identified as 1896, since the process was not developed until October, 1895, and the work was taken up at Orange in June or July, 1896, and Higgins had nothing further to do with it. Aschenger, who first took up the work at Orange, cannot be found and it is believed that he is dead. The efforts made to locate him appear in the stipulation between counsel (pp. 485-488).

Dodd (whose deposition appears in the companion suit on Macdonald patent No. 626,709) has had charge of the manufacture of the composition since May, 1897, and it appears (R. P. 62, Q. 16) that it is still made by the identical process as developed in October, 1895.

RESUME OF THE DEVELOPMENT OF THE RECORDING COMPOSITION.

From what has been said the development of the modern sound recording composition involved the following successive steps or phases:

(1) Originally the material used was a natural wax or wax-like material or various combinations thereof, such as ceresin, paraffine, ozokerite, carnauba wax, beeswax, etc. These materials were relatively soft, melted at low temperature, and were comparatively sticky, so that a record could be formed in or upon them only with difficulty and when formed would result in poor reproduction, with many foreign noises, and would be quickly obliterated.

(2) The first advance was the discovery that artificial wax-like materials could be produced having properties that

fitted them more perfectly for the intended use. These artificial materials were metallic soaps, the most promising of which, and the one that was finally adopted and continuously used, was stearate of soda. To permit of this material being molded it is dissolved in about an equal proportion of stearic acid or in other words, is partially saponified. In connection with the selection of stearate of soda as a suitable foundation material, the important observation was made that glycerine was objectionable, however the same might be presented.

(3) Following the selection of stearate of soda dissolved in free stearic acid came the discovery that the crystalline character of the soap could be corrected by the introduction of a very small amount of stearate of alumina. *This was essentially a new discovery* and was not the result of inventive genius in the usual sense.

(4) The first plan adopted for introducing the stearate of alumina in the composition was by an aluminate of soda solution formed by dissolving acetate of alumina in caustic soda lye. By such a process care had to be taken to see that the volatile acetic acid was driven off, because its presence in the composition was objectionable.

(5) Finding that the material was too hard for the shaving-off knives, the attempt was made to soften it somewhat by the addition of oleic acid and a large number of blanks were so made. It was found, however, that when subjected to hot weather, the oleic acid resulted in destroying the record surface and the observation was then made that has ever since prompted the careful elimination of this ingredient, and the selection of a grade of stearic acid which shall be as free from oleic as possible.

(6) Oleic acid being found to be unfitted as a softening ingredient, ceresin was selected for this purpose and has ever since been used.

(7) The next advance was to simplify and cheapen the process by making the stearate of alumina as a separate ingredient from alum and incorporating it as such in the composition.

(8) The next advance was the observation that carbonate of soda could be used to effect the saponification of the stearic acid. This became possible when the formation of an aluminate of soda solution was not necessary. Its use cheapened and improved the process. As the process was so far developed it was carried on at Silver Lake by the Edison Manufacturing Company on a very large scale between the years 1890 and 1895.

(9) Finding that the separate formation of stearate of alumina introduced practical difficulties and that it was commercially impossible to prevent the contamination of the stearate with foreign matter when made on a large scale, the original process of first producing an aluminate of soda solution was resumed. Metallic aluminum was therefore dissolved in a lye of caustic soda and carbonate of soda, the aluminum used being first in the powdered form, and then in the sheet form.

(10) The process as so developed by Aylsworth in October, 1895, and as practiced by the Edison Manufacturing Company at Silver Lake, until June, 1896, was resumed at Orange by the Edison Phonograph Works in June or July, 1896, and has been carried on by that concern continuously since that time.

EVIDENCE AS TO ACTUAL USE AND SALE.

It is not seen how there can be the slightest question as to the commercial adoption and manufacture of the modern sound recording material by the Edison Phonograph Works and the Edison Manufacturing Company from the year 1889 up to the present time, as the facts have already been recounted. In view, however, of the fact that the main de-

fence on the patent in suit is prior knowledge and use of the invention and public use and sale thereof in this country more than two years before the date of the application, a brief reference to the evidence on these points may be made:

(1) The testimony of Redfearn (pp. 253, etc.) shows the purchase of enormous quantities of the various ingredients including stearic acid, caustic soda, carbonate of soda, ceresin, acetate of alumina, alum, and metallic aluminum. The purchases by the two companies correspond exactly with the narrative as related by Mr. Aylsworth. They show that the ingredients were purchased first by the Edison Phonograph Works for delivery at Orange, then by the Edison Manufacturing Company for delivery at Silver Lake and finally about June or July, 1896, by the former concern again. They show that acetate of alumina was bought by the Edison Phonograph Works for use at Orange and never by the Edison Manufacturing Company for use at Silver Lake. They show that metallic aluminum was not purchased until October, 1895, and that in the sheet form (except in one case) it was not purchased until manufacture of the composition was resumed at Orange. Corroborated and supported as these purchases are by the testimony of a number of admittedly trustworthy witnesses, there can be no question but that they show the carrying on of operations on a practical and commercial scale.

(2) When the composition was made by the Edison Manufacturing Company at Silver Lake it was sold in bulk to the Edison Phonograph Works at Orange and, by the latter concern, was molded into blanks. Bills and vouchers have been introduced showing sales between May, 1890, and December, 1893, of between 240,000 and 250,000 pounds of the composition (p. 268, Q. 54) and from April, 1894, to May, 1896, of almost 180,000 pounds thereof (p. 258, Q. 33). It is impossible to believe that such enor-

mous shipments as these could have been anything else than is claimed for them.

(3) The testimony of Aylsworth, Miller, Higgins, and Dodd is the evidence of the practical men who developed the composition and carried on its commercial manufacture. All of these witnesses are fully agreed as to the essential facts and if there are any inconsistencies in their testimony they are the usual and expected kind; as, for example, Mr. Miller's recollection that the metallic aluminum process was developed in October, 1894, instead of 1895.

(4) The deposition of Mr. Edison is entirely corroborative of Aylsworth, although naturally not so complete in its details since Mr. Edison's connection with the matter was largely in an advisory way. He recalls the early use of natural waxes and wax-like materials (R. p. 448, Q. 4) and that Aylsworth produced stearate of soda (Q. 11) in a partially saponified form (Q. 13). He also testifies concerning the efforts to reduce crystallization by the use of magnesia and alumina (p. 450, Q. 19) and the final adoption of stearate of aluminum for this purpose (Q. 22). He testifies concerning the observations made as to the undesirability of oleic acid (Q. 31) and glycerine (Q. 33) and the overcoming of these difficulties by the use of Mitchell's stearic acid (p. 452, Q. 34). Also the use of ceresin as a non-hygroscopic ingredient (Q. 35). He testifies (p. 456, Qs. 65-6-7-8) that the large quantities of material referred to in the Redfearn deposition were used in the composition; that the hundreds of thousands of pounds of composition sold by the Edison Manufacturing Company to the Edison Phonograph Works was the particular composition here involved, employing stearate of soda, ceresin, stearic acid and stearate of alumina; and, that as to the make-up of the enormous number of records and blanks sold to the Columbia Phonograph Company and others from 1889 to 1896—

"They must have been of the composition I have recited, that is to say, the regular composition, because we made no other composition, commercially."

(5). Mr. Macdonald, complainant's factory manager (p. 489, Q. 1) testifies that the Columbia Company

"used them (Edison blanks) from the time they commenced business in Washington, in 1889, up to this time" (1894) (p. 511, X-Q. 111).

He says (p. 501, X-Q. 54):

"As far as I could judge by outward appearances, it was similar to the Edison formula of today."

Mr. Dodge, who assisted Mr. Macdonald in his experimental work (p. 357, Q. 20) states that in August, 1890 the Edison blanks "had the same appearance as the blanks of the present date" (p. 354, Q. 4).

Mr. English who is at present connected with the Victor Talking Machine Company, (p. 458, Q. 1), testifies (p. 461):

"Q. 29. Do you recall the general character of the blanks that were made in those days at the Phonograph Works?

A. The general character in appearance and consistency corresponded to blanks that I recently purchased.

Q. 30. As far as you can tell, the composition was the same as it is now.

A. Yes, sir.

Q. 31. Did you observe any tendency on the part of the blanks in the early days to mold or become spoiled on the surface?

A. In the very beginning when they were first used we had some little trouble in that way, but that was only to a very limited extent."

Mr. English left the employ of the Phonograph Works in the spring of 1890 (p. 458, Q. 3).

Miller, who was succeeded by Aylsworth upon the latter's return to the work in October, 1895, testifies as follows (p. 220):

"Q. 85. Are you familiar with blanks made at the present time by the Edison Phonograph Works?

A. I am not, as I have not made any wax since Mr. Aylsworth had taken charge.

Q. 86. I have reference to the physical properties of the modern blanks, their smoothness and general physical character, rather than their process of manufacture. From this point of view, are you familiar with modern phonograph blanks?

A. I am.

Q. 87. How do the modern blanks compare in their physical properties with the blanks made by you at Silver Lake for the North American Phonograph Company in 1891 and thereafter?

A. There is no perceptible difference."

There is not the slightest shadow of a suspicion in the testimony that the Edison recording composition of today is not the identical composition of 1889, and we do not apprehend that complainant will question this fact.

(6) As early as January 27, 1890, Mr. Macdonald purchased Edison blanks from the Edison Phonograph Works (R. p. 279). The purchases of blanks by the Columbia Phonograph Company commenced in February, 1889 (R. p. 280) and continued until November 27, 1894 (R. p. 282), the entire purchases being in the neighborhood of 70,000 blanks. The total number of blanks sold by the Edison Phonograph Works between February, 1889, and November, 1892, was over 450,000 (R. p. 282, Q. 83), and the number sold from November, 1892, to October 31, 1896, was over 750,000 (p. 283, Q. 86) making a grand total of over 1,200,000 blanks. It is of course inconceivable that

these blanks should have been anything else than we have asserted for them. If they were of a different composition or if they were physically or structurally deficient, it would have been an easy matter for complainant to produce evidence of those facts.

(7) A number of records and blanks made in the early days and still preserved have been introduced as exhibits for the inspection of the Court and for comparison with the recording composition as now made. These will be briefly referred to:

(a) Wangemann produces a record (Defendants Exhibit, Wangemann, 1888 Record) made by him December 16, 1888, on one of the first examples of the modern composition (p. 225, Q. 10). Undoubtedly this was No. 871, since the troublesome oleic acid composition (No. 957) did not come until some time after December 6, 1888.

(b) Mr. Upton, who was Edison's mathematician in the early electric-light days, produces a record (Defendant's Exhibit Upton Record) which was made on January 1, 1893 (p. 204, Q. 5). The record must have been made at that time because it contains the voices of persons who, it is proven, were then at Mr. Upton's house (Qs. 8-11).

(c) Mr. Upton also refers to one dozen records which were turned over to Wangemann (p. 205, Q. 15) and which were all made prior to or during the year 1892 (Q. 16). Wangemann states that these identical records were exhibited by him in Minneapolis in the fall of 1890 (p. 236, Q. 66) and he explains in other ways how they are identified (Q. 68). Mr. Miller states that six of these records are duplicates made under his supervision (R. p. 221, Q. 89) and that they were made prior to 1893 (Q. 91). He also identifies them by their physical appearance (p. 222, Q. 93). The other six records were made in the Edison Laboratory (p. 223) some time before the duplicate records referred to (Q. 101). Mr. Aylsworth also identifies these twelve

records as having been made prior to 1893 (p. 173, Q. 309).

(d) Aylsworth produces six records (Defendant's Exhibit Aylsworth Records Nos. 1, 2, 3, 4, 5 and 6) which he obtained from Wangemann (p. 166, Q. 297). These records were all analyzed by him and he testifies that three of them were made in accordance with the so-called "Useful Data" formula (pp. 168-9); that one of them corresponds with formula No. 1046 (p. 169, Q. 302) and that two of them correspond with formula No. 871. Of course there are discrepancies between the results shown by these analyses and the original formulas as theoretically worked out, but this would be expected (p. 171, Q. 307). Aylsworth further testifies concerning these six records (p. 172, Q. 308) as follows:

"Yes, I can identify these as being made prior to 1893, because of the manner of making the blanks, as seen in records Nos. 4, 5 and 6. I also observe that these records Nos. 5 and 6 especially, must be very old because when cut into it is seen that there is a change of color, the outside being of a salmon color and the small portion of the interior or middle is the original color of the cylinder. This change in color I am familiar with and know the cause to be the gradual absorption of oxygen, which causes the stearate of iron which the record contains as an impurity derived from the iron kettles, to change to the ferric or higher oxidation stage, which produces a brownish or salmon color. It would take years for the action to penetrate to the depth which it has in these two records. I observe that since the records were cut to take samples for analysis early in January up to this time, there has been no perceptible change in the lighter interior portion; the age of a composition of this kind could be fairly accurately determined by the depth of discoloration. These records are the same composition as was manufactured previous to 1893 by the Edison Manufacturing Company and Edison Phonograph Works, and which were molded into records and blanks and sold commercially."

(e) Mr. Aylsworth also produces eight records which have been continuously in his possession from some time prior to 1893 but which unfortunately were damaged by fire in February, 1906. Two of these records have been partly shaved off and are introduced in evidence. (Defendant's Exhibit Aylsworth Original Records No. 1 and No. 2). An inspection of the several records above referred to will show that their composition so far as the eye can determine is the exact composition of the present date and the evidence shows that in a chemical sense these original records are the same as the modern blanks. They certainly disclose the utilization of a material that after almost twenty years presents its original brilliancy and high quality, with not the slightest tendency to mold or deteriorate. We do not see how any other conclusion can be drawn from the entire evidence presented by the defendant and supported by contemporaneous documentary proof and by physical exhibits, than that the present blank composition made and sold by defendant has been continuously made and sold by the defendant and its predecessors and associates from the year 1889 up to the present time. Nor can there be any question concerning the process or method by which this composition has been produced. In every case the process has involved the partial saponification of melted stearic acid by means of a suitable lye such as caustic soda, carbonate of soda or both in solution, and in every case the process has involved the subsequent addition of a non-hygroscopic softening ingredient, such as ceresin. From December, 1888, or somewhat earlier until about August, 1889, the process involved the formation of stearate of alumina in the composition during its manufacture by introducing with the lye an aluminate of soda solution formed by dissolving an aluminum salt, such as the acetate, in caustic soda. From August, 1889, or thereabouts, until October, 1895, the pro-

cess involved the addition of separately formed stearate of alumina obtained by the precipitation of stearate of soda by alum. From October, 1895, up to the present time, the process has corresponded identically with that originally used except that carbonate of soda has been relied upon to effect the major part of the saponification and the aluminate of soda has been formed by dissolving metallic aluminum in caustic soda lye. But in a chemical and practical sense all of these processes are equivalents since they are all designed to produce the same identical composition.

Having now explained the development of the modern recording composition and its actual manufacture and sale by defendant, let us enquire into the situation of the complainant prior to the date of the application for the patent in suit.

THE POSITION OF COMPLAINANT IN THE EARLY DAYS.

As we have before pointed out as late as April, 1893, the complainant was still using the old paper tube blank "coated with a thin flexible and soft layer of ozokerite wax" (p. 835). The facts are fully explained in the affidavit of Dodge made in November, 1894, only a little over a year after these records were still used by the American Graphophone Company. Mr. Dodge says (p. 836, folio 948):

"Mr. Easton, who was made general manager of the company on or about the first of May, 1893, also recognized the fact that the soft cylinders were decidedly impracticable, because, very shortly after his assuming that position, he, to a great extent, caused these soft cylinders to be discarded, employing in their places hard phonograph cylinders purchased by him, I understood, from the Edison Phonograph Works for the use of the Columbia Phonograph Company, of which said Easton was at that time President. At the present time (November, 1894), according to my infor-

mation and belief, very few, if any, of the soft ozokerite wax cylinders are being placed upon the market by the Graphophone Company."

Mr. Dodge further testifies (p. 357, Q. 20):

"Q. 20. After you made the batch of ozokerite blanks for the World's Fair, what did you then do?

A. I started experiments under Mr. Macdonald's supervision on a metallic soap blank, similar to the Edison blank, our object being to produce a blank like the Edison blank.

Q. 21. What was the reason for your trying to produce a blank like the Edison blank?

A. It was recognized by Mr. Macdonald, in fact, every one who had any knowledge of the talking machine business, that the success of the phonograph was due very largely to the blank they used."

Complainants were confronted by a serious commercial situation, one of the elements of which was the recording composition, although Mr. Dodge (speaking contemporaneously of the events in his affidavit) refers to other troubles which they had encountered. Obviously as to the recording composition there were four courses open to complainants:

First, to purchase such blanks as they needed to carry on their business, from the Edison Phonograph Works; second, to produce a composition equally as good as that adopted and manufactured by the Edison Company; third, to have some one produce such a composition for them or to independently invent the Edison composition; or, fourth, to surreptitiously acquire the secret of the Edison composition.

Complainants can never be fairly said to lack industry and fertility in adopting the suggestions and inventions of their competitors, and it is therefore not surprising to note that when confronted with the situation that Mr. Dodge refers to, they resorted to all four of the possible courses open to them.

I.

That both Mr. Macdonald and the Columbia Phonograph Company were large purchasers of Edison blanks from February, 1889, until November, 1894, has already been shown. Prior to May, 1893, when Mr. Easton who had been president of the Columbia Phonograph Company (an Edison licensee) assumed charge of the American Graphophone Company those two concerns, at least to outward appearances, were substantially independent, but ever since that date they have been closely affiliated and are now practically identical. Therefore, large quantities of Edison blanks were purchased by the Columbia Phonograph Company when its interests became those of the American Graphophone Company.

II.

MACDONALD'S ATTEMPTS TO PRODUCE A
SATISFACTORY COMPOSITION.

Dodge in his affidavit states that he experimented with Macdonald at Bridgeport on metallic soaps (p. 836, folio 947), but that up to the time he left (May, 1894) they had not been successful in producing a satisfactory composition. He says (p. 838):

"In addition to the objections which I have heretofore stated in connection with these two types of hard cylinders, it was found that shortly after being molded and turned down, a *bluish-white incrustation*, resembling mould, appeared upon the surface, and the longer the cylinders stood before being used the greater became this mould or incrustation. This was found very objectionable by users, especially in connection with cylinders on which records were made which were designed to be permanent, for the mould would form in the record grooves and in reproducing the record this conduced to confusion of the sounds and the production of scratching noises. This objection, too, was fully

recognized by the Graphophone Company, and particularly by its manager, E. D. Easton. It was one of the causes which in May, 1894, induced the Graphophone Company to discontinue the manufacture of cylinders. Prior to this, however, every effort was made to avoid the difficulty. During the early experiments the Graphophone Company even went so far as to purchase from the United States Phonograph Company a quantity of fragments of phonograph cylinders of metallic soap (known as 'scrap wax') made by the Edison Company, and this was melted down at the Bridgeport factory and remoulded into new cylinders. It was found that the cylinders made from this Edison Company material did not have the objectionable feature of incrustation referred to.

The manufacture of cylinders, like the hard types referred to, was commenced sometime in the fall of 1893, and continued to some extent up to the time I left the Graphophone Company in May, 1894."

Concerning the actual experiments Dodge testifies (p. 358):

"My recollection is that the experiments made by Mr. Macdonald were not satisfactory and most of them were made with castile soap and an addition of litharge. This mixture melted at a very high temperature and was very difficult to mold. He had also attempted to make a mixture of stearic acid, saponified with caustic soda, to which was added a small quantity of litharge. His attempts were not a success and we experimented jointly in endeavoring to secure material like the Edison blanks. In order to familiarize ourselves with the nature of the latter material, we secured several barrels of broken Edison blanks and studied the conditions under different temperatures, the composition in the melted state and its appearance when it began to harden or congeal."

It is clear from Dodge's deposition that during the time of his experimental work up to May, 1894, neither he nor

Macdonald had produced a satisfactory composition and that in every case the blue mold or efflorescence developed, which of course would be fatal to success. In all of this work, either oxide of lead or acetate of lead was used. Macdonald seems to have been impressed with the idea that the Edison composition employed litharge (oxide of lead) as stated by Dodge (p. 358, Q. 30), but in any event, either for this reason or for lack of chemical imagination, Macdonald limited himself to lead salts, except in one or two isolated instances referred to by Fargo in which alum was used (p. 302, Q. 47), but which was unsatisfactory (Q. 50).

Fargo gives a long and detailed deposition in which Macdonald's ludicrous efforts to make a satisfactory composition are explained, accompanied by the contemporaneous note books. Fargo was Dodge's assistant (p. 296, Q. 14) and refers to the use of acetate (or sugar) of lead and litharge or red lead (p. 297, Q. 23). Concerning the blanks which had been made up to the time of the departure of Dodge in May, 1894, he says (p. 297):

"Q. 25. How did the blanks which Mr. Dodge made compare with the Edison blanks?

A. They were very similar looking when they were first made, but after they stood for a week or ten days, there was a very heavy blue smoky, cloudy appearance came over them, and while at the first the record made on them was very good after they stood a week or ten days and *the blue mold began to appear*, the records were very scratchy and harsh."

When Dodge left, Fargo succeeded him (p. 298, Q. 28). According to Fargo "I tried everything that I thought might make a better cylinder and *overcome the blue smoke*" (p. 299, Q. 38). It is sufficient to say concerning Fargo, that although he apparently disclosed a commendable spirit of activity, no chemical intelligence whatever appears to

have been applied to the solution of the problem either by him or by Macdonald. Although Fargo continued his experiments after Dodge left, throughout the year 1894, lead was always used, either in the form of acetate or oxide, and always without success. The firm conviction that the Edison composition made use of lead in some form, was so firmly rooted in Macdonald's mind, that he could never depart from it, and he was apparently laboring all along under the delusion that the secret of success in the Edison composition was in some special proportion of the ingredients used. It will be found that all of the experiments conducted by Fargo under Macdonald's direction were directed to the same combination of ingredients using a lead salt but varying in proportions.

As we will now see, Macdonald in September, 1894, regarded the problem as hopeless and confessed his inability to reproduce the Edison composition. We find him in that month waving the flag of distress and calling for assistance. As a chemical inventor he admitted his failure.

Certainly Macdonald's own experiences would not be painted by himself in blacker colors than necessary, and no doubt the description of his position as given to Melzer is as favorable as he could make it. We find him writing to Melzer on February 2, 1895 (p. 862) as follows:

"When I first attempted to make a cylinder in 1893 I added some Castile Soap to Stearic Acid and then hardened the mixture by adding litharge or lead oxide. This gave an idea, if nothing more. I next tried adding the lead directly to the stearic acid in a dry state, *uniting all that the stearic acid would take up*. This gave an exceedingly hard compound, but of little use for cylinder work. I then tried to saponify the mixture, but, as a rule, *succeeded only indifferently well*. I used water, and also added the caustic soda in a dry form. The greatest difficulty I experienced was the 'gummy' character of the blank, and next they were

very noisy. Also it was very difficult to mold them. As we had been making the paper ozokerite cylinder, and had the ozokerite handy, I tried tempering the blank with ozo. I went through quite a long series of experiments in this line *without much success*. After a long time I tried the acetate of lead. This gave much better results as to texture of composition, and records. I then had made a number of stearic acid soaps both by adding the soda dry and in water. After working with this for quite a while we thought we had a composition that was good enough, and started their manufacture. The result you know. *Sweating destroyed the record entirely.*"

III.

MELZER SUCCEEDED INDEPENDENTLY OF MACDONALD IN SUBSTANTIALLY REPRO- DUCING THE EDISON COMPOSITION.

The story of the relations between Melzer and Macdonald is of great interest as it appears in Melzer's deposition, and in the printed correspondence between them (pp. 843 to 910). The letters prior to January 8, 1895, appear in the Melzer deposition. The difference in character between the two men very plainly appears, the former being a chemist of ability and a man of honor and the latter a chemical ignoramus, who, when the secret had been disclosed to him in language as plain as A, B, C, required months of patient correspondence and demonstration by Melzer before appreciating its significance. In September, 1894, Macdonald inserted the following advertisement (p. 384, Q. 5) in the American Soap Journal & Perfume Gazette:

"WANTED.—Thoroughly practical man capable of carrying on experimental work in hard soap making. Work is on a metallic, insoluble soap not used for washing purposes. One versed in the working of stearine, waxes and *lead soaps* greatly to be preferred. Address: T. H. Macdonald, Manager, Bridgeport, Conn."

It is significant to note that in this advertisement Macdonald still adheres to his delusion on the subject of lead. Previous to this advertisement the matter had been brought to the attention of Mr. Melzer, who is a manufacturer of soap in Evansville, Indiana, (p. 376, Q. 1) and, as his testimony shows, a skilled, intelligent, and very resourceful soap chemist, by the editor of the paper, Dr. Gathmann. This was in August, 1894 (p. 377, folio 1362). On September 11, 1894, Macdonald writing to Melzer (p. 385, Q. 7), said:

"We are endeavoring to obtain a composition for the purpose of making records upon the graphophone that shall be an improvement on that we now use.

"Our chief difficulty lies in a clouding or corrosion of the surface after it has been shaved ready for the record.

"We have been using the composition noted in my letter to Mr. Gathman. That gives the best results we have yet obtained.

"In case we should agree that you would undertake to work for us, of course we would furnish you with all the data in our possession regarding the mixture. Answering that portion of your letter, I would say that we do not use water at all.

"We melt, usually, 320 pounds of 'AA' brand stearine, *not stearic acid*. When thoroughly melted we add about 50 pounds of black ozokerite. We then add slowly 40 pounds of acetate of lead and when thoroughly united add caustic soda in powder to the extent of about 32 pounds. The mixture is then cooled and molded."

Several things are of interest in connection with this disclosure from Macdonald to Melzer. Since complainant's argument, as foreshadowed in the rebuttal deposition of Macdonald, will no doubt be that the relation of employer and employee existed between Melzer and Macdonald under

which the latter would be entitled to claim as his own any developments made by the former in carrying out Macdonald's suggestions, it is important to ascertain what those suggestions were. We therefore find that on September 11th, 1894, Macdonald was still confronted with the difficulty of clouding or corrosion of the surface. We also find that at that date he was making the composition without the use of water, the caustic soda being added not as a lye but in powdered form. We also find that at that date he was using stearine and not stearic acid. According to Aylsworth if stearine were used it would result in the production of "a composition so full of glycerine that it would be impossible to cast a successful record from it" (p. 138, Q. 233). We also find that at this date Macdonald was using black ozokerite, which is the most impure form of ceresin. We also find that at this date Macdonald was using acetate of lead, which does not present the advantages of aluminum and possesses the further danger of acetic acid. We also find that at this date Macdonald was practicing a totally different process from anything which we have so far considered, or which has been practically used, that process consisting in first melting the stearic acid, then adding the ozokerite, then the acetate of lead and finally the powdered caustic soda. There was no suggestion in Macdonald's mind at that date of forming caustic soda lye and dissolving the metallic salt therein. Finally, it is important to note that at that date Macdonald was using a relatively enormous amount of acetate of lead, the amount suggested being in fact more than twelve per cent of the stearine used. In the case of acetate of alumina, for example, in experiment No. 858 (R. p. 61, Q. 47) 18 parts in 500 were used or about $3\frac{1}{2}$ per cent, while in the patent in suit the proportion of aluminum hydrate is only about 2 per cent. Apparently with such an enormous amount of acetate of lead as Mac-

donald suggests, the effect would be to precipitate the stearate of soda produced, resulting in the formation of stearate of lead as with the very earliest of Mr. Aylsworth's experiments. On September 14, 1894 (p. 386, Q. 9), Mr. Melzer wrote to Macdonald and said:

"We will undertake the experiments for you, and will charge you nothing if we fail; if, on the other hand, we should succeed in producing an article in every way suited to your wants and satisfactory, we will expect a remuneration corresponding to value of our time and labor, and feel satisfied there will be no trouble in agreeing with you upon this question."

On September 19, 1894 (p. 388) this offer was accepted. From the proposition as made by Melzer and accepted by Macdonald we do not perceive any of the conditions entering into the usual relation of employer and employee. Melzer did not enter Macdonald's employ or the employ of the American Graphophone Company. He started on his own account as an independent inventor and experimenter and was to be properly remunerated if he succeeded but was to receive nothing if he failed. In this letter of September 19, 1894, Macdonald refers to the fact that the composition "must not mould, effloresce, or change character in any way." On that date the "best mixture" was of a slightly different proportion from that suggested in his letter of September 11, the amount of acetate of lead being slightly reduced; also a suggested modification of the process was described of adding the acetate of lead after the saponification. Recognition is made of the first contribution by Melzer in the statement:

"Possibly, *as you suggest*, Stearic Acid would be better than the ordinary commercial Stearine."

And what is of greater importance is the statement made by Macdonald that

"Our mixture is in fact a *saponified Stearate of Lead* with the addition of a little Ozokerite or Ceresine (which is refined Ozokerite)."

As we have previously pointed out the employment of a relatively enormous amount of acetate of lead would probably result in the precipitation of stearate of lead from the stearate of soda, as with Aylsworth's earliest experiments, and this fact seems to have been recognized by Macdonald when he refers to his composition as "a saponified Stearate of Lead." There was no suggestion in his mind at that time of the presence or necessity of stearate of soda or free stearic acid, in a commercial recording material.

Acting under the arrangement between Macdonald and Melzer, the latter immediately began to experiment, three of such experiments being noted (p. 390, Q. 15) but all employing lead salt. Two departures from Macdonald's practice are, however, to be observed in these experiments, namely, the use of *stearic acid* and the employment of caustic soda *in the form of a lye*. Melzer had also apparently recognized the importance of reducing the amount of the lead salt, because in the first of these compositions the proportion of lead oxide used *was only slightly over 3 per cent*. These samples were sent to the American Graphophone Company on October 20, 1894 (p. 390, folio 1416). They were criticised by Macdonald in his letter of October 31, 1894 (p. 391, Q. 21) as being "too gummy." One very brilliant suggestion of Macdonald's illustrating the depth of thought that he was able to put into the problem, is made in this letter, where he says:

"We are beginning to doubt the wisdom of putting in ozokerite. We think it would be as well to experiment without it, as it seems to introduce as bad elements as it cures, to say the least."

It is sufficient to say of this suggestion that ever since 1889 the employment of a hydrocarbon ingredient, such as ceresin or ozokerite, has been regarded as absolutely indispensable. If Melzer has followed Macdonald's suggestion and left out ozokerite or its equivalent, he would no doubt be still experimenting in Evansville! Further experiments are noted by Mr. Melzer under date of November 4, 1894 (p. 393). Two of these are of great interest as disclosing the use of *an aluminum salt in small proportions*, the oxide being used. Here was the exact Edison formula and it only required a correct determination of proportion to make the successful composition. Melzer states (p. 394) that in making these compositions the oxide of aluminum was dissolved in the hot caustic soda lye. These compositions were sent to Macdonald by Melzer on November 7, 1894 (p. 397), in which letter Melzer said:

"We have now thoroughly exhausted this subject, have experimented with almost every known metal, wax and gum, making up a barrel full of samples, and find only three metals are available for this purpose, and of these three, the one represented by samples of composition D and E sent you by Adams Express to-day is, in our opinion, the best."

This metal was aluminum, which by a process of exclusion and a trial of everything, Melzer had happily hit upon. Macdonald next wrote to Melzer on November 17th in reference to these samples (p. 398) and said:

"After using and carefully testing the cylinders made from the materials sent us by you, *we are satisfied that it is all right*. It molds readily, is easily shaved and prepared for the record, and the record has a good quality, being smooth and brilliant. In shaving down the rough mold we found it perhaps a little more brittle than former mixtures, but not enough so to cause any

serious inconvenience. I would not be willing to sacrifice any of the good recording qualities for the sake of having it less brittle. * * * * * If you are satisfied that the mixture will not effloresce or 'cloud' in any way, I think we are about ready to complete our work and take the mixture. * * * * * Would it not be well for the writer to go to your factory *to thoroughly learn the process* of the proper mixing of the materials. We do not want to make any mistake in this particular, of course, and desire the very best results on the start."

On November 10th (p. 400) Mr. Melzer again wrote to Macdonald expressing the belief that the brittleness referred to could be overcome and saying:

"As to statement of expenses, etc., we fear that, if we charged you full value for our time, chemicals, materials, expressage, gas, glassware, etc., etc., you would be greatly surprised, as these experiments have taken a great deal more time than we had any idea. We do not make a business of experimenting for others, anyway. The subject of making a soap for phonograph cylinders interested us and we went into it without much regard for the amount of money there would be in it to us. Let us spend a little more time on this matter, and when we have made a complete success of it we hope in view of the importance of this matter to you, you can afford to pay a liberal price for the recipe."

Following this suggestion, Melzer made further experiments under date of December 3, 1894 (p. 401, Q. 42), still using the oxide of alumina dissolved in caustic soda lye, but varying very slightly the proportions. On November 21, Melzer replied to Macdonald's letter of the 17th (p. 402, Q. 43), and pointed out the correct cause of efflorescence that had been encountered by Macdonald in his experiments with acetate of lead, namely, the formation of acetate of soda. On November 23, 1894 (p. 403), Macdonald

expressed the hope that he might be put "in the way of commencing work as soon as you (Melzer) can make it possible." On December 3, the compositions before referred to (p. 401, Q. 42) were sent to Macdonald for his criticism, the statement being made that "we have put in this week making compositions of different degrees of hardness and plasticity" (p. 404, Q. 45). On December 9, 1894 (p. 406), Melzer informed Macdonald that he regarded his time, labor, materials "*and results obtained*" as being worth "at a low estimate \$500." Macdonald on December 13, 1894 (p. 406), thought that "\$500 is pretty high," notwithstanding the fact that he had been placed in possession of the secret that he had been vainly striving to acquire for two years. Dealing with Melzer as if he were purchasing cord wood or scrap iron, he asked if he could not be given "a little better figure" (p. 406, Q. 47). Melzer apparently felt as any person of spirit might feel under the circumstances, and on December 18, 1894 (p. 407), wrote to Macdonald saying, among other things:

"It is improbable that you could find another person both competent and willing to undertake the work we have done for you, particularly upon the terms, 'no success, no pay.' We have worked diligently on that composition for 60 days, including nights and Sundays, and believe we have made a low figure for this. Our time employed in our regular business brings us a great deal more, and special work, particularly when attended by success, ought to pay still better. We have two or three problems to solve in our own business, and would cheerfully give \$500 for the solution of any one of these, regardless whether it took the party half an hour or half a year to work it out; but, alas, the information is not obtainable at any price. Rather than accept one cent less than amount named, we would prefer to take no money at all. Send us a nice graphophone for our parlor and we will tell you how to make the composition for your cylinders."

It was not unnatural that Mr. Melzer in this letter should say that "as it is always more satisfactory to know something about people we have business with, we would thank you for a brief statement or reference." The succeeding letter from Mr. Macdonald of December 22, 1894, is of interest, since he refers to his own experiences. He says:

"I worked out the formula I sent you which makes the wax that 'sweats' some time ago. At that time the company were using the soft ozokerite cylinder for commercial purposes, and were buying phonograph cylinders for the purpose of finer work. When I got the acetate of lead mixture I thought that I had something that was equally good. And, to make it short, I was given a contract by the company to make the cylinders, provided that I could give them a cylinder for musical purposes that would be equally good. I thought that I could do so, and commenced work. The sweating did not develop for some time, not until a large number had been made and sold. As soon as it did the cylinders began to come back. Of course this stopped further work on my contract. I was then in the position where I must at once furnish good cylinder material or pay for the damage. When I telegraphed to you I had just been formally notified under the terms of the contract that I would be obliged to furnish a suitable wax by January 1st next, or have the contract cancelled and pay the damage resulting from the loss of music and other records placed on the soft cylinders.

"The loss has already been considerable, and may be more. I think that the composition that you have sent will do the work, *and to say that I appreciate your work is to say but very little of what I feel.*"

Having in this way definitely pointed out to Melzer how very serious his own position in the matter was, how much he was indebted to Melzer in saving him completely from ruin and to show his appreciation of Melzer's work, Mac-

donald "most gladly" accepted Melzer's offer "to receive one of our machines in payment"; and in order that Melzer might not have the opportunity of changing his mind the machine was sent that very day! (P. 410, folio 1494.) On December 26, 1894, Melzer replied and said (p. 412, folio 1502):

"You can assure your Co. that, very soon after January 1st, you will be in position to supply cylinders that will be eminently satisfactory in every respect. We will send you tomorrow, by Adams Express, the recipe with detailed instructions, notes, samples of the material, addresses and 2 or 3 samples of standard composition, and if you will carefully follow our instructions, you will have no trouble making the composition, and should any occur, nevertheless, then write to us or make us a visit and see us about it."

The information referred to was not sent until December 31, 1894 (p. 413, Q. 51). In a letter of that date (folio 1512) Melzer said:

"We have sent you by Adams Express today a box containing samples of composition, materials used for same, and a few pieces of glass ware, that you might not be able to obtain conveniently in your city. In one of the boxes of toilet soap you will find a little red book containing recipe and full directions for making the composition; also all other information that we believe you might need. Follow our directions conscientiously and you will have no trouble, we think; if, nevertheless any difficulty should occur we are at your service. The other box we send you today contains a bottle of 37½° Caustic Soda Lye, enough for 50 lbs. or more of composition."

Demand was made on counsel for complainant to produce the "little red book" referred to by Mr. Melzer, but so far it has not been forthcoming, and Macdonald claims that

it is lost. There is, however, no suggestion in complainant's testimony that the disclosure made by Melzer to Macdonald at this time was not full and complete. Melzer states that the formula disclosed to Macdonald was based on his record of experiments made from December 26th, to December 30th (p. 415, Q. 53). We direct particular attention to formula "1" under date of December 26, 1894 (p. 416, folios 1518-1519). Originally this composition was formed of 50 ounces of stearic acid, 9 ounces of paraffine, $10\frac{1}{4}$ ounces of 37 degree lye and $\frac{7}{8}$ ounce of aluminum hydrate, the latter salt being dissolved in the lye. This composition was heated for two hours from 90 degrees to 130 degrees C. It was then found to be "slightly crystalline." Melzer then added $\frac{1}{2}$ ounce of stearic acid and observed that it was "very crystalline." He then added $\frac{3}{8}$ ounce of lye, with the note that it was "better; slightly crystalline." Finally $\frac{1}{2}$ ounce more of stearic acid was added with the note "Now all right." In other words, in making up this formula "1," although Melzer started out with 50 parts of stearic acid, he added two additional increments of $\frac{1}{2}$ part each making a total of 51 parts of stearic acid; and although he started out with $10\frac{1}{4}$ parts of lye, he later added $\frac{3}{8}$ parts of lye, making a total of $10\frac{5}{8}$ parts, the final formula appearing at the right of the first proportions used. If, now, we multiply each one of the figures given in formula "1" by 8, we obtain a formula which we shall presently have to refer to as having a vital bearing on the patent in suit. Such a formula would be: Stearic acid 408 parts; lye (caustic soda) 85 parts; paraffine 72 parts; hydrate of alumina 7 parts. On January 3, 1895, Macdonald wrote acknowledging receipt of the formula and sample (p. 424, Q. 75), and thanking Melzer for his "most excellent work in our behalf." In this letter Macdonald says:

"I send you, at last, by Adams, a box containing a number of records on the various cylinders made from *your material*. Also duplicates on cylinders purchased from the Phonograph Co. In my opinion *your mixtures* with the possible exception of the first samples, are fully the equal of anything ever turned out by the Phonograph Company and several samples I consider infinitely superior to them. There is to me a virility, a brilliancy, in the record, that those on phono cylinders do not possess. I have been going carefully over your directions for the mixture, and will, tomorrow, *make my first essay at a mixture.*"

This letter of Macdonald's further indicates his utter unfamiliarity with the problem and his fear of departing in any way from the exact letter of Melzer's instructions. For example, having on hand a grade of stearic acid "with 5 per cent paraffine added," Macdonald could not determine that the same result would be reached, if the proportion of paraffine in the Melzer formula were reduced. He did not know whether Greenbank's alkali (one of the purest forms of caustic soda) could be employed, and he asked:

"Can the Lye and hydrate alumina be mixed then and set aside for use in car-boys."

In fact, this letter of Macdonald's, like those which followed, clearly indicates the true relation between the two men, one being the untutored and unskilled scholar seeking information on all points and utterly lacking in imagination, and the other the skillful teacher having a complete mastery of the subject and good naturedly and with the utmost patience, striving to impart such knowledge as his pupil was capable of absorbing. There was certainly no question of equality between the two and the gulf was as great between them, in point of knowledge, as between the humblest French student and Louis Pasteur. Macdonald's impudent claim that he was the employer, that his was the

directing mind, and that Melzer was the willing and subservient employee, who was merely carrying out the ideas and directions imparted to him, while typical of the man and of his associates, is an insult to the intelligence.

Consider, for example, Macdonald's letter of January 8th, 1895 (p. 843) when he was apparently paralyzed on ascertaining that hydrate of alumina was different from the oxide, and Melzer's patient explanation in his letter of the following day (p. 844). Here again we find the relation of the highly skilled teacher and the blindly ignorant scholar. On January 18, 1895, Macdonald made his first report (p. 849), and said:

"I am not having quite as good success as you did. Of course this could hardly be expected."
Again, in the same letter (p. 850), he said:

"I feel, however, that I am on the right track and that *I will soon acquire the cunning that will produce a good cylinder.*"

Sometime after this, Macdonald apparently believing that he could not be properly instructed by correspondence, determined to visit Evansville, and, according to Melzer, he arrived there on February 9, 1895, and stayed until February 19th (p. 382, folio 1382). The proposed trip is referred to in Macdonald's letter of January 25 (p. 852, folio 1012). Fargo refers to this trip of Macdonald's, but incorrectly places it in the winter of 1894 (p. 303, Q. 54). A letter written by Macdonald to Fargo, from Evansville, dated February 15th (Defendant's Exhibit Macdonald-Fargo letter) clearly fixes the date (p. 811). On February 24th, after having spent ten days at the feet of Melzer trying to learn how to make the composition, Macdonald wrote from Bridgeport (p. 865) referring to a new experience:

"I found considerable trouble in regard to 'pin holes' in finished cylinders. This is a rather queer difficulty and I found it from my former cylinders also."

References to pin holes are found in Macdonald's letters of March 14, 1895 (p. 866), March 29, 1895 (p. 868), April 12, 1895 (p. 881), June 22, 1905 (p. 890), and July 2, 1895 (p. 893). In fact Macdonald in his letter of June 22, 1895 (p. 890), says:

"If I could lay that ghost, I would be happy."

Obviously it was necessary that Melzer should be again consulted and Melzer was called to Bridgeport. He went there on July 19, 1895, and remained until July 30 (p. 434, Q. 98). On the subject of pin holes—the "ghost" that Macdonald could not "lay"—he says (p. 429, Q. 85).

"The 'pin holes' complained of by Mr. Macdonald were evidently caused by the lack of care in the manipulations of molding these cylinders. I found the conditions under which Mr. Macdonald worked rather primitive. The vessels used for pouring liquid composition were open tin vessels which discharged their contents from the top, thus permitting all air bubbles of which there are generally more or less on the surface, to run into the molds, there to be arrested in the congealing mass to form flaws, 'pin holes.' In place of the tin vessels or dippers discharging from the top I ordered and used tin vessels having a spout starting from near the bottom of the vessel, same as in the case of the ordinary teapot; by employing these vessels which took the liquid composition from near the bottom of the vessel where it was free from air bubbles and by using proper care in general in the manipulations of molding, the 'pin holes' were eliminated almost entirely."

The simple expedient of pouring the melted composition into the molds by means of a teapot, solved all the difficulties with which Macdonald had labored for almost eight months. We find in this fact a further indication of his extremely limited chemical ability and lack of imagination. He apparently believed that the "pin holes" were caused by

some fault in the composition, and, in fact, many of his letters written during this period very thinly veil the suspicion on his part that Melzer after all had not succeeded in reproducing the Edison formula. He lacked the cleverness to perceive that his difficulties were purely of a mechanical nature, and, under the same conditions, would have been encountered with any composition. After Melzer had been to Bridgeport and had thus straightened things out, there were apparently no further difficulties. On August 11, 1895 (p. 894), Macdonald writes:

"Cylinders seem to be going along all right. Pin holes are very scarce, so much so as to be of no consequence whatever."

Fargo, speaking of Melzer's visit, says:

"He showed me how to put the mixture together and the proper proportions to use" (p. 309, Q. 71).

After Melzer left, Fargo took up the actual manufacture under the Melzer formula (p. 309, Q. 74), making several thousand blanks daily (310, Q. 78).

MELZER OR MACDONALD—TO WHOM SHALL CREDIT BE GIVEN?

This completes the story of Macdonald's relations with Melzer. It is thought that but one conclusion can be drawn from the incident and that conclusion is not favorable to Macdonald. He met Melzer with a continuous and uninterrupted record of unsuccessful experiments behind him, and face to face with utter and complete failure. He had not succeeded in making a successful composition nor could he have possibly done so along the lines he was following. He was on the wrong track both as to the composition and its method of manufacture. What he had done was not within the claims of the patent in suit. He was in the usual condition of an experimenter admitting failure and

preparing to abandon further efforts. Melzer was appealed to as the savior of the situation and from that time on Macdonald became a wooden puppet, without initiative, without ideas, without imagination, and without courage. Melzer very wisely did not follow the lines of Macdonald's unsuccessful experiments, for had he done so he would not have reached the goal. He started on an absolutely new track. Entirely independent of Macdonald, he made the following observations or discoveries: First, he suggested the use of stearic acid, instead of stearine; second, he discovered the availability of aluminum for the purpose of correcting the crystallizing tendency of stearic acid; third, he observed that the metal so used should be employed in very minute proportions; fourth, he suggested the employment of caustic soda lye, instead of the dry powder; fifth, he proposed to dissolve the aluminum salt in the lye to produce aluminate of soda; and, sixth, he so selected the proportions of ingredients as to leave within the composition a large amount of stearate of soda, instead of precipitating the same by an added salt as was probably done by Macdonald.

The most that could be claimed for Macdonald's disclosure to Melzer was that the composition should comprise or embody a metallic soap, although the particular soap that he had experimented with (lead stearate) happened to be the wrong one. Macdonald denies that at the time he first undertook his experiments he knew that the Edison composition made use of a metallic soap (p. 503, X-Q. 66, X-Q. 69, X-Q. 70). Dodge, however, says that when he began to experiment with Macdonald in 1893, "it was generally understood that the (Edison) blank was a metallic soap, with a small quantity of ceresin" (p. 357, Q. 22), and in his affidavit executed in November, 1894 (less than three months after Macdonald's first disclosure to Melzer), he refers a number of times to the fact that the Edison compo-

sition was a "hard metallic soap" (p. 837, folio 950). This would seem to confirm his statement that to this extent the knowledge of the Edison composition was public property, and if this is so Macdonald made absolutely no suggestion to Melzer that the latter could not have obtained from anyone in the art. We submit that as between Melzer and Macdonald the former must be clearly regarded as the actual inventor of the composition. Of course, he was not the *first* inventor, because, at the date of its invention by him, the composition had been manufactured and sold for more than five years by Edison. But he was undoubtedly an *independent* inventor, who had honestly and unwittingly reproduced the Edison composition. If, for example, both Macdonald and Melzer were interfering applicants, could there be any question as to whom the patent would be awarded? Under these circumstances, there is not the slightest shadow of doubt but that Melzer and not Macdonald would be entitled to a patent. Not only so, but under the interference practice, Macdonald would have no standing as an inventor in any sense and his own work would be dismissed as merely unsuccessful and abandoned experiments. Macdonald's attitude in this matter was not particularly gracious, to say the least. It would seem that after having failed himself most dismally, and having been pulled out of a mire by Melzer, he should, at least, have been generous enough to give Melzer the credit that was his due. Common decency should have required it, especially since Melzer, instead of receiving the very modest compensation requested, was awarded for his time, labor and skill, by the gift of a graphophone. It is repugnant to one's sense of justice to now find Macdonald contending that the credit for Melzer's invention must be his—that he was the great and brilliant chemical inventor, standing behind the Evansville experiments and directing their course; that Melzer was merely the paid employee car-

rying those instructions into effect; that Macdonald, in fact, furnished the brains and Melzer the hands; and that, because of this situation, the outcome of the Evansville experiments was Macdonald's and was not Melzer's. Such a contention will certainly not appeal with any force to the conscience of the Court.

IV.

ATTEMPTS TO DISHONESTLY ACQUIRE THE EDISON FORMULA.

(1) Contemporaneous statements of events are obviously of greater weight than statements based upon recollection after considerable time. Emerson, who is the Superintendent of the musical department of the Columbia Phonograph Company (p. 472, Q. 1), in an affidavit made November 24, 1894, says:

"In July, 1894, I was approached by Mr. R. F. Cromelin, an officer of the Columbia Phonograph Company, and as active associate with Mr. Easton in the exploitation of the graphophone, who, assuming that I knew the composition and method of manufacture of the Edison Phonograph blanks, *asked me to disclose the same*, and suggested that if I should go to Washington and give Mr. Easton the information I would be paid liberally. This episode resulted in a correspondence between Mr. Easton and myself early in August, 1894, in which Mr. Easton urged me to give him the information, and I refused to have anything to say upon the subject" (p. 913).

It will be noted that these efforts were made between May, 1894, when Dodge left the experiments in a hopeless condition, and September, 1894, when Melzer was discovered. It was undoubtedly a period of discouragement and distress and the commercial situation no doubt was thought to warrant heroic measures for relief.

(2) English, who had quite an amusing experience with Macdonald, to be later referred to, says (p. 466) :

"Q. 70. Did Mr. Macdonald ever tell you that he had tried in numerous ways to acquire the Edison formula?"

"A. He did.

"Q. 71. Do you recall what he said on this point?"

"A. There were remarks made on the subject, but I do not remember whether it was Mr. Macdonald or his assistant who made them.

"Q. 72. Who was his assistant?"

"A. If I remember rightly it was Mr. Dodge.

"Q. 73. Do you recall what Mr. Macdonald or Mr. Dodge said?"

"A. That efforts had been made to secure the formula through secret agents at the Phonograph Works."

(3) Melzer made a chemical analysis of an Edison blank and submitted the same to Macdonald in his letter of March 31, 1895 (p. 869). This analysis is referred to by Fargo who recorded it in his note book under the heading "Analysis of Edison Cyl." The analysis is also referred to by Macdonald in his letter to Melzer of April 12, 1895 (p. 881) :

"I have turned to your analysis of the S. L. (Silver Lake) cylinder many times with a deal of interest many times. *Do you think it would be possible to make this mixture and get the precise result there shown*" (folio 1131).

MACDONALD'S EXPERIENCE WITH ENGLISH.

(4) English had been employed by the Edison Phonograph Works, but left in the spring of 1890 (p. 458, Q. 3). For some time he acted as purchasing agent both for the Edison Laboratory and for the Edison Phonograph Works (p. 459, Q. 12). He knew that Aylsworth was working on the recording material (Q. 7). As purchasing agent

he brought large quantities of stearic acid (Q. 15), acetate of alumina, caustic soda and ceresin (Q. 60). He refers somewhat in detail to these ingredients (Q. 21) and had "a suppositional knowledge" as to what they were used for (p. 460, Q. 24). As to the stearic acid (Q. 25) and ceresin (Q. 26) he saw these ingredients actually used (Q. 28). In November, 1894, English disclosed to Macdonald a composition of stearic acid, acetate of alumina, caustic soda and ceresin (Q. 45), *which were the very materials that he had purchased while connected with the Edison Phonograph Works* (Q. 46.) November, 1894, it is to be remembered, was after Melzer had started experimenting, but before the aluminum samples were submitted to Macdonald. English places the date of his disclosure to Macdonald as November 2, 1894 (p. 464, Q. 53). Macdonald paid English \$500 for this formula (p. 465, Q. 57), which it will be remembered was the exact amount that Melzer thought his formula was worth. It seems the irony of fate that Melzer, who had worked out his formula by hard labor and as the result of the highest skill, should have had to satisfy himself with a *graphophone* as his sole reward, while English, who acquired his knowledge of the formula from inside information as purchasing agent, should have received \$500 for it. The situation becomes doubly painful, when we reflect that Melzer's formula was a success, while that suggested by English was a dismal failure. Life, however, often presents instances of this sort, and in the field of invention virtue often is not rewarded.

Macdonald does not deny that this formula was given him by English, although he later found that he had been sold a "gold brick" (p. 496, Q. 32). He further says (p. 496, Q. 33):

"I did try this formula with very good results. The mixture appeared to be of very close grain and just about what we would like to have for a cylinder ma-

terial, but, upon letting it stand for any length of time, especially in a hot, moist atmosphere, the surface would become very badly clouded; in fact, in a great many cases, worse than the formula which we were using which contained the oxide of lead. It was therefore of very little use to us, and we never have used this formula in any way, except experimentally."

It may be said in passing that the evil results encountered by Macdonald would have been expected, since Aylsworth encountered the same difficulty when using acetate of alumina when all the acetic acid was not driven off (p. 78, Q. 81). After the acetate of alumina formula was suggested to Macdonald by English, Macdonald tried it on his own hook and submitted a sample to Melzer, who writes concerning it on January 29, 1895 (p. 853), and predicts that it "is bound to cause 'sweating' in damp weather and an efflorescence in dry." On February 2, 1895, Macdonald wrote Melzer regarding the acetate of alumina formula, *apparently as a crowning invention of his own*, and said (p. 864, folio 1058):

"I then began to try the other acetates and about the middle of November last *happened on* acetate of Alumina, which, with the exception of your comp. gave me the best results of anything I had yet tried. This was the 'sour smelling' cylinder of which you spoke. The way has been long, also at times very weary. My training had not been in this line and I was, therefore, handicapped in the struggle. Well, I think it is past now, *thanks to you*, and hope that *we* will all enjoy the fruits of the successful blank."

The reference in the above quotation to "sour smelling," shows that acetic acid was present in a free state, and difficulties were to be expected. A continued heating of the mixture would have driven this off, but such a radical thought as this would not have occurred to Macdonald as

his "training had not been in this line." We commend to the Court also, Macdonald's happy facility of expression in stating that he "*happened on acetate of alumina*," if by these words, he intended to tell the truth of its disclosure to him by English.

Notwithstanding Melzer's prediction of ultimate trouble with the acetate of alumina formula, Macdonald was still unconvinced. He wrote Melzer on March 29, 1895 (p. 868, folio 1074), as follows:

"I have been assured on no less authority *than the former manager of the Edison Phonograph Factory* that the Silver Lake People used the *Acetate of Alumina*, and that they do not use water. Do you think this possible? It is a serious matter to me to have a failure now, and anything that will promise success is hopeful."

Melzer was too intelligent a man to believe this statement, and, in his letter to Macdonald, of April 1, 1895 (p. 875, folio 1101), he says:

"It may be that the Silver Lake people *have at some time used acetate of aluminum*; there is surely none in the comp. we analyzed."

On April 8th (p. 880), Macdonald still adheres to his belief and says:

"I have it from no less authority than the former purchasing agent of the S. L. (Silver Lake) people that they use Acetate of Alumina. *He told me positively that he had purchased it for them by the barrel for over two years.*"

Again on April 12th, Macdonald was still loyal to the English formula, because he says (p. 882, folio 1129):

"I have made up a large number of cylinders by the dry process using acetate Alumina, and I must confess that the results are splendid. I sent 50 of them to Washington and Mr. Child pronounced them equal to anything yet received."

The English experience came to a comical end, although no doubt to Macdonald the incident had all the elements of a tragedy, when on May 26, 1895, he wrote Melzer and said (p. 889):

"Since writing to you before this I have come to the conclusion that the so-called dry mixture, that is made with acetate of alumina, is of no use. It is beginning to sweat. That is enough. We don't want to touch it again with a 40-foot pole. It has acted just as you said it would."

V.

MACDONALD'S EXPERIENCE WITH STORMS.

It may be said at the outset as to Storms that he is a drunkard, and we freely admit that his testimony should be considered with caution. At the same time, we do not entertain the slightest doubt that he has told a perfectly true story, since it agrees in every detail with all the facts of the case and is substantially corroborated by Macdonald himself.

Storms entered the employ of the Edison Phonograph Works in November, 1889 (p. 191, Q. 3), and in August, 1896, was foreman of the molding department (Q. 9), when Aschenger had charge of the mixing of the composition (Q. 8). In August, 1896 (Q. 14) the formula of the Edison composition was disclosed to Storms by Higgins (Q. 13) who, it will be remembered had charge of the mixing operations at Silver Lake. Higgins, however, knew only of the use of the so-called aluminum bronze powder, since the use of sheet aluminum was not taken up until manufacture was resumed at Orange by the Edison Phonograph Works. Storms gives the formula that was disclosed to him by Higgins (Q. 17). It will be observed that this formula corresponds almost exactly to that given in "Defendant's Exhibit, Higgins Note No. 1," the variations being extremely slight. Storms fully describes the Edison process

(Q. 19) as he saw Aschenger perform it (Q. 20). He had every opportunity to witness these operations, because his room was next to Aschenger's (p. 194, Q. 30), and he was free to go in and out of Aschenger's room (Q. 31) for probably six weeks. Higgins could naturally not be expected to freely admit the breach of faith on his part in disclosing the formula to Storms; and perhaps he may have unconsciously disclosed it. His testimony on the point is as follows (p. 481):

"Q. 57. Did you ever meet a man named Storms over here at Orange?

"A. Yes, sir.

"Q. 58. What was Storms doing?

"A. I think he was molding, or had charge of the boys who molded the cylinders.

"Q. 59. Did Storms seem to be curious about the composition?

"A. He used to often ask me what things were used, just what stuff was in the wax.

"Q. 60. Did you talk with Storms about the composition?

"A. Yes, I suppose I have.

"Q. 61. Storms was anxious to know what the composition was made of and you talked with him about it?

"A. Yes."

Whether the Edison formula came into Storm's possession from Higgins, or from some one else, is after all unimportant. It is sufficient to say, that in some way Storms became possessed of the secret, as he was obviously not a man who could have evolved it independently, as was the case with Melzer. Having obtained the Edison formula, Storms wrote to a friend of his, Von der Lippe, who was employed by the Graphophone Company, asking for a position in Bridgeport (p. 195, Q. 37). Mr. Von der Lippe testifies that he had known Storms at the Edison Phono-

graph Works (p. 348, Q. 9), and recalls receiving the letter (Q. 16) in which he was asked to see Macdonald in reference to giving Storms employment. He saw Macdonald and told him "that Mr. Storms worked in the wax room at the Edison Company" (Q. 18). He goes on to say (Q. 19):

"He (Macdonald) asked me *what Storms could do at the wax business* and I told him I did not know what he could do at the wax business. Mr. Macdonald asked me to send for Mr. Storms to come up and see him. I did so, and Mr. Storms came up and Mr. Macdonald spoke to Mr. Storms when I introduced Mr. Storms to him, but I don't recall the conversation which took place between them."

Storms entered the employ of the Graphophone Company the day after Labor Day, 1896 (p. 195, Q. 39), but he had seen Macdonald the week previous, at which time Macdonald told him that if he had the Edison formula he would be employed (Q. 38; Q. 42). At the time of the first visit, he suggested that Macdonald should purchase aluminum powder from the Pittsburg Reduction Company, and also sal soda and ceresin, as they were using paraffine, as with the Melzer formula (Q. 47). These ingredients were all ready when he went to Bridgeport the day after Labor Day, 1896 (Q. 48). On September 10, 1896, the first batch of composition was made (Q. 50), and samples were sent to Washington (Q. 53) for approval by Mr. Easton. It was then decided to adopt the Edison metallic aluminum composition in place of the Melzer formula, which up to that time had been used (Q. 57). Storms continued to make the Edison composition for the Graphophone Company for about two years (p. 1907, Q. 60). Mr. Fargo testified concerning Storms as follows (p. 313):

"Q. 93. Who was Mr. Storms?

"A. He was a man who Mr. Macdonald secured, as I understood through some man in the shop, who was

acquainted with Mr. Storms in Orange, N. J. I was told he was able to make the Edison mixture, and that he had been hired to come to Bridgeport and enter the employ of the Graphophone Company with that object in view.

"Q. 94. Before Mr. Storms came up to Bridgeport, did Mr. Macdonald have any conversation with you concerning him?

"A. Yes; he stated that Mr. Storms was coming to Bridgeport to work for the Graphophone Company, working on this mixture spoken of. I immediately asked him what effect that would have on my position; his answer was, that it would have none; *that they would find out what this man Storms knew of the mixture, and then they would let him go, or give him a position somewhere in the factory.*

"Q. 95. When did Storms come to Bridgeport?

"A. To the best of my recollection it was early in September, 1896."

Fargo also refers to Storms in his note books. For instance, in one entry headed "Edison Mixt." (p. 829, folio 919), Fargo uses the expression "White Ozo," instead of ceresin, having evidently been told that the substance was a purified form of ozokerite; and he refers to the aluminum as "Some powder of a slate color, think there was about 20 ounces or about that of the powder." In the next entry (folio 920) he refers to the addition to the boiling lye of "some kind of a powder which was of a slate color and put up in oiled paper, or at least the paper was oiled from the powder, if not oiled paper—think there was from 10 to 20 oz. used." In a later note he was able to identify this slate colored powder more definitely. Thus, under the heading "*Mixture made by Storms which he says is the Edison Mixture,*" he refers to the addition to the boiling lye of "a quantity (about 6 inches in diameter x 1 in. deep) (I should say one lb.) of a powder (Aluminum Brz.) (Bronze

Powder) bought of the Pittsburg Reduction Company of New York, Room 10 and 11, Havemeyer Bldg., 26 Cortlandt St., N. Y." (p. 824, folio 899). Under the same note (p. 825, folio 901) Macdonald also guessed at the amount of aluminum used by Storms:

"Mr. Macdonald said the quantity of Aluminum Bronze Powder is one pound to 300 lbs. stock."

In this guess Macdonald was nearer right than Fargo, as he evidently knew of the great lightness of aluminum. In the same note also Fargo had discovered that white ozokerite was "Sirisene or Ciricine" (p. 825, folio 901).

After Macdonald had by these methods been put in possession of the Edison formula, he could not resist the temptation to renew his correspondence with his old friend in Evansville, no doubt to show what a very bright and resourceful man he was in meeting and solving commercial problems. Writing on September 3, 1896 (p. 895), and after inquiring pleasantly as to the toilet soap business and suggesting the possibility of the "free coinage of soap," all obviously for the purpose of leading gracefully to the serious matter in hand, he said:

"I recently learned an interesting thing in connection with the Phono cylinder. A party who pretends to know states that it is made of Stearic Acid, Caustic Soda, Sal Soda 'Aluminum Bronze Powder' and water. The alleged process is to dissolve the 'Al Bronze' in a solution of Caustic and Sal Soda, and then unite this with the Stearic Acid as usual. They use white Ozokerite for softening the mixture. I have found that 'Aluminum Bronze Powder' is pure Aluminum ground to an almost impalpable powder. I wrote to N. Y. and obtained a sample of it. I enclose a little of it in an envelope. I did not learn anything in regard to the proportions to be used. What do you think of it?"

Of course Macdonald did not know the correct proportions on September 3, 1896, because Storms had not actually started work, but he had already seen Storms and had ascertained what the ingredients were. Melzer immediately replied on September 9, 1896 (p. 897), but regarded it as "the height of folly to use the metal in the form of the bronze powder" owing to its expense (p. 899, folio 1198), although he admits that ceresin possesses some advantage over paraffine (folio 1200). With his usual fertility of suggestion he discloses a formula to Macdonald using metallic aluminum (p. 900, folio 1204). Macdonald replied on September 21, 1896 (p. 901), and said:

"Now in regard to the formula I mentioned *as coming from the E. people*. I am afraid you will have to modify your good opinion of Thomas as there is little doubt that their formula is practically what I told you. In fact the man who gave me the information came to the factory, and with the materials which I bought for him made up some 400 cylinders and they are all right. I am to have a number of records made on them and I will send you a dozen tomorrow. He has not given me the exact formula but *as I saw him make it*, I think it was very nearly as follows:

100 lbs. Stearic Acid,	
23 lbs Sal Soda	} dissolved in about 5 gal.
1 lb. Caustic Soda	

water and then add at boiling point 6½ oz. Al. Bronze powder."

On September 30, 1896, Melzer in writing to Macdonald, is still unconvinced, and says, that

"If Edison really uses this (aluminum powder) in his cylinders, then I can only hide my face and weep over the fall of another of our idols" (p. 902, folio 1212).

Macdonald again replies on October 6, 1896 (p. 904), and says:

"I sent you by Adams Express yesterday six records on the cylinder which we have had under discussion. They are certainly good, and they are made in exactly the way I have stated to you. *They have so made them at Edison's place*, and if your idol stood on a more scientific foundation than this, to earth he must come at last! The young man who made these, and they are out of a batch of 300 lbs. *made them in my presence*. I did not ask him for the exact weight of his ingredients, *but they were about as I have written you*. The mixture takes about the time ours takes."

On October 17th, Macdonald again wrote to Melzer (p. 906), and said:

"*The young man of whom I spoke in my former letter assures me that every cylinder made at the Edison Works during the last four years has been made with Al. Bronze Powder*. He has made us a quantity of them exactly, so he says, as they are made there, and to tell the truth they are good cylinders and resemble the phonograph product so closely that I can not tell the difference, so *down comes that idol!!*"

The last letter from Macdonald was written June 20, 1897, in which he said (p. 910):

"We have been making a large number of cylinders *on the Edison method*, that is, using the metal Aluminum and Sal Soda in the solution. We are now making up some special cylinders for Mr. Emerson's use, but not that way. They are being made *on your formula*."

RESUMÉ OF MACDONALD'S WORK.

(1) Macdonald's own efforts were a dismal failure, and when assisted by Dodge and Fargo no greater success was encountered. In August or September, 1894, we find him in the slough of despond, and calling loudly for help. At that

time he had succeeded in obtaining a composition, according to his own statement, of stearate of lead and ozokerite. It was an utterly impracticable material that could not possibly have been made suitable for the purpose. It did not have the correct molding properties, and in other ways was unsuited for recording and it possessed the inherent vice of molding or efflorescing.

(2) The first actual disclosure of an aluminum salt as a possible ingredient in recording compositions, was when the acetate was suggested to Macdonald in November, 1894, by English, and this suggestion came directly from the Edison Phonograph Works. Macdonald's experiments with acetate of alumina were as unsuccessful as with acetate of lead.

(3) Melzer was appealed to in August or September, 1894, and by December had succeeded in independently reproducing the Edison composition which was disclosed to Macdonald by letter of December 31, 1894.

(4) Even with the Edison composition in his possession, Macdonald came perilously near making as much of a botch of that as he had with the previous use of lead salts, as well as with the English formula. He went to Evansville to receive instruction from Melzer and on his return to Bridgeport was apparently as much at sea as ever. It was not until Melzer went to Bridgeport himself and suggested pouring the composition in the molds by means of a tea pot, that Macdonald was able to succeed.

(5) In September, 1896, Storms going to Macdonald directly from the Edison Phonograph Works and with the Edison formula in his possession, disclosed the same to Macdonald. It was adopted by the American Graphophone Company and as late as June, 1897, was referred to as the "Edison method."

THE PATENT IN SUIT.

It would seem to us that anyone reading the foregoing story and fully understanding the facts, upon being told that the matter was involved in litigation, would naturally conclude that the action was brought against the American Graphophone Company to enjoin them from using the formula and method dishonestly acquired from the Edison Phonograph Works or from using the Melzer formula, which Melzer had independently invented or for cancelling the Macdonald patent for fraud in obtaining it. At any rate, the impression would be created that any suit in which that story was told, would necessarily involve a correction in some way of the flagrant injustice which had been done the Edison Phonograph Works or else the enforcement of an adequate remuneration to Melzer. This, however, is not so, and shocking as it may seem, the suit is based on a patent granted to Macdonald on an application filed November 27, 1896, in which he claims as his own both the Melzer formula and the Edison formula, the alleged infringement being the manufacture and use of the identical recording composition which the National Phonograph Company and its predecessors and associates have continuously manufactured since 1889.

Language fails to adequately characterize such a situation, yet notwithstanding the fact that defendant's answer clearly outlined the defences here presented, the complainant proceeded with the suit and defendant was put to the expense of taking elaborate testimony in various parts of the country. Complainant may have thought that after a lapse of so many years the truth could not be brought out, but defendant has been fortunate in being able to present to the court not only the testimony of all the men who were familiar with the facts, but much of the documentary evidence and especially the original correspondence between Melzer and

Macdonald. Even after the defendant's testimony had been taken, complainant proceeded with its proofs in rebuttal, but such evidence was futile, and only serve to add further proof of the fraudulent character of complainant's methods, and must so impress the court. Defendant was, therefore, put to the necessity of printing a large record and of preparing its brief. This situation is unusual and we submit—if the court feels as we do that complainant's case is without a particle of merit—that complainant's actions in pressing the suit to a hearing, is an imposition on the court, which should be punished as a contempt by a substantial fine, a part of which should be paid to defendant to reimburse it for its expenses so unjustly incurred.

The patent in suit, tainted as it is with fraud, does not require more than a very hasty consideration:

(1) In the first place, the state of the prior art is incorrectly given, apparently for the purpose of misleading the Patent Office. The specification says:

"It has been heretofore proposed to use as a sound-recording material an insoluble soap made by saponification of any fatty acid by means of an earthy alkali, such as lime. It has also been proposed to employ a metal, such as lead, combined with stearic or oleic acid, and particularly a mixture of oleate and stearate of lead; but tablets made of insoluble lime-soap or of stearates or oleates of lead have never yielded commercially successful results" (p. 1, lines 36-46).

We may say, in passing, that this disclaimer covers precisely what Macdonald disclosed to Melzer and includes the best of his previous work.

The oath to the specification was made by Macdonald November 25, 1896. More than one month before that, on October 17, 1896, he had been assured "that every cylinder made at the Edison Works during the last four years have

been made with Al Bronze Powder." Furthermore, as early as April 12, 1895, he had turned over the analysis of the Edison composition "many times with a deal of interest" (p. 882, folio 1131).

(2) The patent goes on to say:

"Several practical difficulties have been encountered in endeavoring to make tablets composed wholly or in part of soap. The chief difficulty has been that the surfaces of such tablets become coated after a greater or less length of time with a bluish film having the appearance of mold and which has been termed 'efflorescence.' This is due to the presence in the material of hygroscopic compounds, which on being attacked by moisture, work out to and spread upon the surface of the tablet" (p. 1, lines 46-57).

By the above statements Macdonald sought plainly to impress the Patent Office with the fact that the recording material before made, inevitably resulted in efflorescence, when for more than six years he and his company had been buying the Edison blanks in which the defect did not occur, and as before noted he admits that the Edison composition of 1892, was similar to the composition of today so far as he "could judge by outward appearance" (p. 504, X-Q. 74).

Macdonald knew perfectly well when the specification for his patent was prepared, that the statements as to the prior art were false and misleading.

(3) The specification further says:

"In carrying out my invention, whereby all the conditions herein pointed out as essential are secured, I take stearic acid as nearly pure as can be obtained and convert it into soda soap in the manner hereinafter explained. The composition, however, differs from ordinary soap in that it contains no oleates, *I having found* that the presence of even a small quantity of oleate or oleic acid is detrimental. It is also important that the

tallow or other source from which the stearic acid is obtained be completely deglycerinized. Except under these conditions the result will be unsatisfactory" (p. 1, lines 79 to 93).

These observations as to the objectionable character of glycerine and oleic acid were made by Aylsworth, in his earliest experiments (p. 57, Q. 37; p. 76, Q. 78). They were also disclosed to Macdonald by Melzer on September 9, 1896, in the following statement (p. 899, folio 1200):

"While on this subject I wish to caution you against using a soft paraffine or a soft *i. e.*, oily stearic acid, or against using any oil, mineral or animal, for softening your cylinders; it will be sure to 'sweat' out in warm weather; I have had several such cases happen to myself and *can trace them all to the use of oleic acid*, soft paraffine wax cylinder oil, adamantine stock, etc."

Mr. Melzer also states that this information was probably recorded in the "little red book," although he points out that stearic acid entirely free from oleic is commercially unknown (p. 422, Q. 71).

(4) The patent continues:

"In converting the stearic acid into soap I produce only a partial saponification—that is to say, instead of using the chemical equivalent in caustic alkali of the fat acid, I use about forty per cent of that quantity of alkali—thus producing what may be called a soap of about two-fifths saponification. This is the proportion which gives the best results, but is of course variable within limits" (p. 1, line 94, to p. 2, line 4).

Concerning the above statement it is clear that it embodies no suggestion of Macdonald's. Partial saponification (ranging from 40 to 60 per cent) had been always performed in the manufacture of the Edison composition, and the same is true of the Melzer formula. While there may have been

some free stearic acid in the stearate of lead composition disclosed by Macdonald to Melzer, Macdonald apparently did not recognize that fact. Melzer points out that he had ascertained that the extreme proportion of caustic soda that could be used was 8 per cent of the stearic acid employed; that with the formula suggested by Macdonald the caustic soda equalled 10 per cent, and that:

"it was very difficult to make a cylinder composition with as much as 10 per cent caustic soda figured on basis of stearic acid employed, and still more difficult to mold the composition containing so little free stearic acid" (p. 395, folio 1434).

If, therefore, we concede that with the stearate of lead formula disclosed to Melzer, free stearic acid was present, there was no recognition of that fact by Macdonald nor did he utilize a useful amount of free stearic acid nor recognize the rather close limits in which it could usefully exist.

(5) The patent further says:

"In this soap I have incorporated aluminum *which I have found* to be the metal best suited in all respects for the purpose. This may be used in the form of aluminic hydrate or in a metallic state, powdered, or in small ingots" (p. 2, lines 17-22).

These statements are peculiarly reprehensible, because it will be seen from a consideration of the claims that the patent is based essentially on the use of aluminum in the composition. Macdonald does not say that he was told by Mr. English or by Mr. Melzer or by Mr. Storms that aluminum should be used, but he makes the claim without qualification, that "*I have found* (aluminum) to be the metal the best suited in all respects for the purpose." This was a deliberate false statement on Macdonald's part and when the oath was made that he believed himself "to be the original, first and

sole inventor" of the composition described in the specification, he knew that oath was false. He knew and now admits that acetate of aluminum was suggested to him by English. He knew, and he now admits, that hydrate of alumina was suggested to him by Melzer. He knew, and he now admits, that metallic aluminum in powdered form was suggested to him by Storms. He knew, and he admitted in his letter to Melzer of October 6, 1896, that the use of scrap or ingot aluminum was suggested by Melzer, because he there says (p. 904, folio 1220) :

"I made up a batch of cylinders today with scrap aluminum, as you directed in your last."

Every source of aluminum, without exception, that is mentioned by Macdonald was suggested to him by others. He admitted in letters written to Melzer long before the application was filed, that the Edison Companies for years had used aluminum and he told Melzer on October 17, 1896. (p. 907, folio 1229), that metallic aluminum had been used at that time for four years. Knowing of these facts we see no other conclusion than that Macdonald made this statement in the specification in a reckless disregard of the truth, knowing it to be false, and for the purpose of misleading and deceiving the Patent Office.

(6) The specification continues :

"The method of introducing the metal is, moreover, important, owing to the tendency of sodium and aluminum when combined to form crystallizable compounds. Preferably the metal is first added to the soda-lye, forming with a portion thereof aluminate of soda (sodium-ortho-aluminate) which readily unites with the stearic acid subsequently added. The quantity of aluminum employed is relatively very small" (p. 2, lines 22 to 31).

Here again Macdonald asserts as his own something to which he has not the slightest shadow of a right. He had never made a composition by first incorporating a metal in the soda lye, but in every case the lead salt was melted with the stearic acid and the dry powdered caustic was added. Aylsworth, except for the period when the stearate of aluminum was added as such, always dissolved the metal or metallic salt to form aluminate of soda, and the same is true of Melzer. Melzer first suggested this process to Macdonald and when Storms appeared he also utilized it. The record does not show the slightest basis for a contention on Macdonald's part that at any time he ever had a remote conception of this feature.

(7) The patent then suggests (p. 2, lines 35-59), under the title of "Formula A," a composition in which hydrate of alumina is used. *This formula is identical in every respect with Melzer's formula "V" which was disclosed to Macdonald on December 31, 1894 (p. 416, folio 1518).* We have pointed out how this formula, with its odd fractions, was evolved. In order, however, to apparently conceal the situation Macdonald has multiplied Melzer's figures by 8, but the Melzer formula is by this subterfuge no more concealed than is the ostrich which buries its head in the sand. Macdonald may have felt that in this way detection was prevented, but no doubt the ostrich entertains the same idea. Perhaps it may be contended that a difference exists between the Melzer formula and that of the patent in suit, inasmuch as the former refers to 37° lye and the latter to $37\frac{1}{2}^{\circ}$ lye. The fact is, however, that the lye sent to Macdonald by Melzer on December 31, 1894, was referred to as " $37\frac{1}{2}^{\circ}$ caustic soda lye." Melzer's note books referring to 37° lye were not accessible to Macdonald, but Melzer's letter referring to $37\frac{1}{2}^{\circ}$ lye was, and it was this latter lye, therefore, that Macdonald refers to.

(8) Finally, the specification contains a second formula marked "B" in which powdered aluminum is used. The proportions suggested correspond almost identically with the formula given by Macdonald in his letter to Melzer of September 21, 1896, which, it will be recalled, was as close to the Storms formula as he could get at that time (p. 902, folio 1209). What variations there may be are too slight to be of importance; for instance, in the patent, Macdonald suggests $1\frac{1}{2}$ pounds of metallic aluminum, while with the Storms formula, so far as he could determine it, based on the same proportion of stearic acid, the amount used was 1 pound and $3\frac{1}{2}$ ounces, or slightly less than $1\frac{1}{4}$ pounds. In describing the Storms formula as he observed it, Macdonald omitted a reference to ceresin, but his experience with the Melzer formula would, of course, enable him to select a suitable proportion of this ingredient, so that Macdonald apparently did not regard it as important enough to write about. Furthermore, it will be recalled that when Melzer suggested a suitable metallic aluminum formula to Macdonald (p. 900, folio 1204), he proposed the equivalent of 63 pounds of paraffine for 300 pounds of stearic acid, which corresponds almost identically with formula "B" of the patent. Mr. Melzer, in his deposition (p. 384, folio 1390), refers to this letter from Macdonald to him and states that "These figures multiplied by three correspond practically to formula B." The slight differences between the two formulae did not impress him as being of any importance, and, in fact, the differences are much less than exist between the so-called infringing formula of Aylsworth patent No. 782,375 and formula "B" of the patent in suit (p. 14).

THE PURPOSE OF THE PATENT IN SUIT.

That it was Macdonald's purpose to claim broadly a composition using aluminum and to claim broadly the process

for making a composition by adding aluminate of soda to melted stearic acid, is clear. The specification was carefully drawn to impress the Patent Office with the fact that Macdonald had succeeded, for the first time, in producing a successful composition, that the prior materials were all faulty and developed efflorescence and crystalization, that the keynote of the composition was the use of aluminum, that he himself had ascertained that fact and that the two formulas suggested were designed to show that considerable variations in proportion and in the ingredients used were permissible. That such was his purpose is clear from the following claims which were originally presented and, upon rejection, were withdrawn:

"11. A composition of matter for a sound recording tablet, composed of stearic acid, caustic soda and aluminum, substantially as described.

"12. A composition of matter for a sound recording tablet composed of partially saponified stearic acid and aluminum, substantially as described.

"13. A sound recording tablet composed of partially saponified stearic acid, aluminum, and a softening material, substantially as described.

"14. A sound recording tablet composed of soda soap having aluminum incorporated therewith."

These claims were presented by Macdonald and he made oath that he was "the original, first and sole inventor" of such a composition at a time when he had placed himself on record in letters to Melzer as knowing that the Edison Phonograph Works had used aluminum, both metallic and in the form of the acetate, for a number of years, to say nothing of the previous disclosure of the exact formula by Melzer to him in January, 1895. When he made oath that such a composition

"has not to his knowledge been in public use or on sale in the United States for more than two years prior to

this application, and that he does not know and does not believe that the same was ever known or used prior to his invention thereof,"

he should have known, and we have no doubt that he did know, that the identical composition claimed by him had been sold by the Edison Phonograph Works continuously since 1889 and that he, and his company, were large purchasers thereof. The specification of the patent in suit not only deceived and misled the Patent Office, but it deceived and misled complainant's own expert, Mr. Cameron. For instance, Mr. Cameron, referring to the material used prior to the patent in suit, states that "it was difficult to avoid the presence of crystalline formations" (p. 20, X-Q. 15) and that another difficulty "lay in the fact that the material would 'mold' " (X-Q. 18) and that it had always been his "impression that *lead was actually employed*" (p. 22, X-Q. 22). Regarding the Edison records, he states that it was his "impression that these records, in common with those of complainant, *were possessed of the defects mentioned*" (p. 22, X-Q. 24). In other words, complainant's expert reads the patent, as it must be read, as apparently representing a very important advance in the art and *as disclosing for the first time a composition in which the defects of crystallization and efflorescence were avoided*. As a matter of fact, it contains not a single suggestion that had not been for years fully recognized in the art; it describes a process that had been practiced commercially to a very large extent by the Edison Phonograph Works in 1889 and by the Edison Manufacturing Company and the Edison Phonograph Works from October, 1895, onward, and it describes a composition that had been in use and on sale and whose make-up was known to a number of persons from 1889 onward.

MACDONALD CONTRIBUTED NOTHING TO THE
ART.

It is unnecessary to point out in detail the particular references in the prior art, antedating all of the suggestions of the patent in suit. It is sufficient to say that the aluminate of soda process in all its details was carried on by the Edison Phonograph Works in 1889 and from October, 1895, by the Edison Manufacturing Company and the Edison Phonograph Works continuously until the present time. This specific process was also independently invented by Melzer and suggested to Macdonald. There is not a scrap of testimony in the case disclosing the carrying out of this process by Macdonald until after it was suggested to him by Melzer. Partial saponification of stearic acid had been suggested by Aylsworth in 1888, and from that time until the present all of the recording material made by the Edison Companies has utilized this feature; and obviously it has always been utilized within proper limits, since the Edison composition from the earliest days has been molded into blanks and sold as such. The correct degree of partial saponification was also independently discovered by Melzer and suggested to Macdonald. The record will be searched in vain for a shred of testimony disclosing the utilization by Macdonald of a partial saponification, at least within correct limits. If we accept Macdonald's own statement, the only composition that he had made before encountering Melzer was stearate of lead, and not a combination of stearic acid and stearate of soda. If, however, we accept Melzer's statement of the formula disclosed to him by Macdonald, it did contain free stearic acid, but in too small a proportion to be of utility in the art.

The suggestion in the patent of the importance of avoiding glycerine was a precaution that Aylsworth had observed in 1888, and was continuously observed in connection with

the commercial manufacture of the Edison composition from 1889 onwards. In fact, if this precaution had not been observed, the Edison composition could not have been successfully made. Melzer also states that this warning was probably impressed upon Macdonald in the "little red book," and we know that a note of warning was sounded against the use of soft and oily stearic acid in his letter to Macdonald of September 9, 1896, which has been previously referred to.

The importance of avoiding oleic acid in the stearic was observed by Aylsworth in the summer of 1889, and has ever since been observed in the actual manufacture of the Edison composition. This point was also brought home to Macdonald in the letter from Melzer just referred to.

As to the suggestion of using aluminum, that was made in 1888 by Aylsworth, and independently in 1894 by Melzer, and furthermore was suggested in November of the latter year by English, who carried the idea from the Edison Phonograph Works. The use of metallic aluminum was suggested by Storms in August or September, 1896. Macdonald now makes no claim to originality in this suggestion.

So far as formula "A" is concerned, we have pointed out that it is identical in every respect with the formula suggested by Melzer and that formula "B" is substantially identical with that taken up to Bridgeport by Storms, who had acquired it through a breach of confidence of an employee of the Edison Manufacturing Company. And as to the final suggestion of using "scrap" or "ingot aluminum," Macdonald gives credit for this suggestion to Melzer in his letter of October 6, 1896.

In other words, there is not a single suggestion in the patent in suit, however small and trivial, that Macdonald can honestly assert was original with him. Every sug-

gestion was made by some one else and disclosed to Macdonald. Ordinarily, in cases of this sort where a patentee bases his invention on the work of others, there is generally *something* in the patent that can be fairly said to represent his own work, but such is not the case here. It is not necessary to consider how much of the patent shall be credited to Macdonald, and how much to others, since there is not a suggestion, or even a hint of a suggestion, that can be said to have originated with him.

MACDONALD'S CLAIM TO INVENTORSHIP.

Macdonald does not dispute any of the facts to which we have referred. He acknowledges the truth of Melzer's story, and he admits the genuineness of the correspondence. He corroborates English in every essential respect, and admits that the acetate of alumina process was given him by English in November, 1894. He admits all the facts connected with Storms and knew that the formula and method used by Storms came from the Edison Company. He now makes no pretense to having discovered the utility of aluminum, or the suggested use of a process involving aluminate of soda. In view of these facts, upon what possible theory, the court will ask, can Macdonald expect to sustain the patent in suit? His position is given in the testimony (p. 499) as follows:

"Q. 49. In what way did the formulas which you had worked up and invented, and which you gave to Dodge, Fargo, Melzer, Gathman and Storms, differ from your patent?

"A. They did not differ at all. I conceived this invention to consist essentially of a preparation of stearic acid. This is first saponified by caustic soda or sal soda. Second, it is rendered non-crystalline by having added a metal, such as oxide of lead, acetate of lead, oxide of aluminum, acetate of aluminum, or oxide of zinc. Third, it is tempered and rendered non-hy-

grosopic by the addition of a hydro-carbon wax such as paraffin, ceresin or ozokerite. In other words, I gave them the four corners of the structure, a complete structure too. They were (1) Stearic Acid. (2) A Metal. (3) A Saponifier. (4) A Hydro-carbon.

"The metal I used worked all right and made a good blank. After a time it developed a fault; Mr. Melzer suggested: 'If you'll change the metal to another oxide, this fault will disappear.'" I did so and the fault was eradicated. No other change was made. The structure still stands as it was before, viz:

- "1. Stearic Acid.
- "2. A Saponifier.
- "3. A Metal (non-crystallizer).
- "4. A Hydro-carbon wax (non-hygrosopic)."

Regarding the above statement of Macdonald's position, it is to be observed that even if it were correct, it still would not justify the appropriation by Macdonald as his own of the discoveries made by Melzer. As will be shown hereafter, under the discussion of the authorities on the point, a patentee can only claim as his own the suggestions made by an employee when those suggestions are in the nature of mere improvements involving mechanical or chemical skill and not invention. For example, in the present case, if Macdonald had in his possession the entire structure of the composition and was using a very small proportion of acetate of lead to correct the crystallizing tendency of stearate of soda, and had then turned the problem over to Melzer to overcome the single difficulty of efflorescence, Macdonald might be entitled to claim the use in the composition of stearate of alumina, *provided, it was well known to chemists that that material possessed the property of correcting crystallization and did not effloresce*. Or, in other words, if its selection was merely a matter of ordinary chemical judgment and skill. But, if the selection of stearate of alumina was made only after painstaking and intelligent experiment,

and if its properties in this art were not known—both of which facts must be assumed in connection with Melzer's work—then the discovery of the use of stearate of alumina was an independent invention which, if patentable at all, must be patented by Melzer, and not by Macdonald. And this fact is doubly emphasized in the present case, when we recall that the use of aluminum is made the most important element of the patented invention, to which all of the claims, with one exception, are limited. Furthermore, the position outlined by Macdonald in the above statement, does not take into account the evidence of prior knowledge and use and public use and sale, which has been made in this case, and which stands absolutely uncontradicted.

Taking up Macdonald's statements, we call attention to the following points:

(1) Macdonald includes among those to whom he "gave" his "formulas," the name of Mr. Storms. This is typical of Macdonald. He admits that Storms came to Bridgeport, brought the Edison formula with him, started to carry it into effect, and he tells Melzer all about it. As late as June 20, 1897, he was still making cylinders on the "Edison Method" (p. 910). Yet, he would have the court believe that Storms was merely an employee, hired to work up Macdonald's ideas, and that whatever Storms may have done, can be appropriated as Macdonald's invention!

(2) It would appear from Macdonald's statement that independently of Melzer he had produced "a complete structure" differing only from the patented composition in the single respect that it made use of lead instead of aluminum. We have pointed out that this is not so. The composition made by Macdonald, which he admits was a failure, was as different from the successful composition as can be possibly imagined. In the first place Macdonald never recognized, nor did he suggest, the correct limits to which the

saponification should be carried, but had made materials which, by reason of over-saponification, were failures both in their recording properties and in their molding properties.

It is most probable that Macdonald never realized that a certain proportion of free stearic acid was necessary. In the next place, with Macdonald's compositions, they were not "rendered non-crystalline by having added a metal," since the entire composition (except as to ozokerite and possibly as to a small proportion of stearic acid), was stearate of lead. The successful composition was one in which the predominating stearate was stearate of soda, and Macdonald has produced no proof of any composition utilizing this ingredient. In the next place it is to be observed that with the successful composition the stearate of soda was accompanied by a *very small proportion* of stearate of alumina. No such composition was ever suggested by Macdonald, but in fact so much lead was used by him, as to entirely precipitate the stearate of soda and produce lead stearate. While it may be a fact that Macdonald had produced "a complete structure," it was certainly a different structure from that which was independently developed by Melzer, and patented by Macdonald. Melzer's composition utilized substantially equal amounts of free stearic acid and stearate of soda, with a minute quantity of stearate of alumina. Macdonald's composition, on the other hand, was composed almost wholly of stearate of lead with a small proportion of stearic acid. As a matter of fact, the only feature in common between Macdonald's unsuccessful composition and Melzer's successful one, was the suggestion of a hydro-carbon ingredient, although Macdonald suggested one of the worst forms of hydro-carbon, and Melzer one of the best. There can be no doubt but that if Melzer had confined himself to the "complete structure" suggested by Macdonald, he would never have succeeded.

When Melzer suggested a 40 per cent saponification of the stearic acid, he had already made a different structure. When he suggested the use of an added metallic salt in such a minute quantity, that while curing crystallization, it would not precipitate the stearate of soda, his structure was a still further departure from that of Macdonald's. And when he determined by experiment, possibly by a happy chance, that aluminum was the metal to be used, his structure was further a departure. When the Melzer composition was finally developed by him, it was no longer the structure suggested by Macdonald, but was an entirely different thing in its make-up, its physical properties, its molding qualities, and in its resistance to deteriorating influences. And further, the fact must not be lost sight of, that the claims of the patent in suit, on which complainant now stands, do not relate to a composition, but are directed to a *process* of making the composition by adding an aluminate of soda solution to melted stearic acid. This being so, from the standpoint of the Patent Law, it is quite immaterial whether the composition suggested by Macdonald to Melzer was, or was not, the same "structure" as that which Melzer developed. The claims in issue covering the process, it is necessary that the suggestion from Macdonald to Melzer, should include such a process or its mechanical equivalent. As a matter of fact, we know that the only process that Macdonald had evolved was one in which the stearic acid and acetate or oxide of lead were added together and the whole saponified by a powdered caustic soda. If, therefore, the patent is considered as covering the aluminate of soda process, Melzer's development of that process was not only entirely independent of Macdonald, but was along lines which Macdonald neither suggested nor thought of. Furthermore, the fact is to be borne in mind that the same process was carried on commercially by the Edison Phonograph

Works in the year 1889, and from October, 1895, onwards. Before dismissing Macdonald's claim to inventorship, his own understanding of the rights of an employer to the benefits of suggestions made by an employee, is of interest (p. 526):

"X-Q. 204. You do not claim then to have been the discoverer of the availability of aluminum as an ingredient in these compositions?

"A. Speaking in the light of this patent, *I do so claim it.*

"X-Q. 206. Please explain this answer?

"A. My understanding is that an inventor is entitled to the assistance of his employees. I gave the problem, together with the bases for the formula, to my assistants. I claim the right to the use of whatever they have made under my immediate direction and supervision. I take it that the use of aluminum in the various ways indicated here was so made, as directed by me, through my legitimate employees and assistants in perfecting this formula up to the point that it appears in this patent application.

"X-Q. 207. As I understand your position then, when Mr. Melzer as the result of his experiments determined that aluminum was the proper metal to use and disclosed the same to you in a little red book, you regard yourself in the eye of the Patent Law as the discoverer of that thing; is that correct?

"A. *That is correct.*

THE ABORTIVE ATTEMPT BY MACDONALD TO SHOW ORIGINALITY.

Macdonald's connection with the composition here involved shows very clearly his habits of thought and his general views on the subject of morals. With him truth was always sacrificed for expediency. He had no compunction in rewarding Melzer in a most absurdly inadequate way, nor in appropriating as his own the result of Melzer's

work. When commercial considerations require it, Melzer is reduced to the level of an employee, carrying out the instructions of his superior. The sordid experience with Storms apparently impresses him as a rather superior stroke of business in which there was nothing reprehensible or immoral.

A small thing, such as doctoring a note-book for the purpose of misleading the Court, and effecting a miscarriage of justice, would, to such a man, be unfortunate, only if detected. And in such a case it would be natural to expect an evasion of responsibility by him, upon detection of the fraud, even though to do so involves his own counsel in an embarrassing and confusing position. A brief word as to this incident may be said.

It will be recalled that Fargo was the assistant of Macdonald, who succeeded Dodge. A number of Fargo's note books were introduced in connection with his deposition, and in these books the abbreviation "Al" frequently occurs, Fargo testifies concerning this (p. 302) as follows:

"Q. 46. Having reference to these particular entries, what does the abbreviation 'Al' refer to?"

"A. I am under the impression that it refers to alum. I know at one time that I used alum, but can not state just the exact time."

In answer to Q. 52 (p. 303), Fargo said:

"I was under the impression that it was alum that was used, but it may be possible that it was acetate of lead."

At the succeeding session Fargo was able to testify positively on this point (p. 307, Q. 63), as follows:

"A. I have carefully thought this matter over during last night, and I believe now that the 'Al' referred to in the note book must refer to acetate of lead and

not to alum, for the reason that these experiments seemed to be made in series and those containing alum consisted only of one or two small experiments. This term 'Al' could not have referred to aluminum, as I knew nothing of aluminum until Mr. Macdonald returned from Evansville, which was in February, 1895. Another reason that leads me to believe that this term refers to acetate of lead is because the quantity used was so large and in the alum experiments the batches were very small, being made in a four-quart agate-iron stew pan."

This error of Fargo's gave to Macdonald a clue by which he might assert for himself a claim for originality in discovering the availability of aluminum. Macdonald's deposition in rebuttal was commenced on May 13, 1907 (p. 489), and he was cross-examined on May 17th (p. 500), May 18th (p. 508), and May 22d (p. 525). On July 12, 1907, certain questions and answers were put on the record (p. 536) as to what Macdonald would testify to, and in answer to Re-D. Q. 246, Macdonald was made to state that certain symbols employed in his note book were intended to represent various chemicals and specifically that

"Al means acetate of aluminum."

Following this statement the witness Manwaring (p. 539) was examined. This witness considers the Macdonald note book, and upon the assumption that "Al means acetate of aluminum," says (p. 550):

"Mr. Macdonald from time to time changes the proportions of his ingredients and changes the form of the metal or metal salt which he is using—that is to say, for instance, one time he will use a form of lead, and another a form of aluminum, and at still other times still other forms of aluminum salts, such as aluminum oxide, aluminum acetate, aluminum sulfate, etc." (Q. 18.)

And again (p. 551) Manwaring said:

"It is also to be noted that *early in his experiments* Mr. Macdonald turned from lead salts, or lead, and experimented with *various forms of salts of aluminum*, so that the Exhibit Note Books clearly *show the use of every feature described and claimed in the patent in suit*, which to my mind clearly evidences the fact that Macdonald did conceive and reduce to practice in the early 90's the process set forth in this patent." (Lines 1-11).

Throughout his cross-examination the witness steadfastly adhered to this opinion, based, as it was, on the assumption that all of Macdonald's acetate of lead experiments were really experiments with aluminum. Macdonald was re-cross-examined on September 17, 1907 (p. 537), and he then admits that Manwaring was entirely wrong, and that the abbreviation "Al" refers only to acetate of lead (X-Q. 247), and that his counsel was in error in assuming that it means anything else (p. 538, X-Q. 255). Macdonald admits that the so-called "index" on page 30 of "Complainant's Exhibit, Macdonald Notes December 24, 1892, to August 27, 1895," was written by him "several years after the entry of the various experiments in the book" (X-Q. 251), and that in this respect the index is incorrect (X-Q. 252). Macdonald's statement can not be accepted. It is a most suspicious circumstance that the error should have been made at all, and that it should relate to so vital a point. It is impossible to reconcile Macdonald's explanation with the action of his counsel and expert, Manwaring, in proceeding on a wrong assumption, when the briefest conference would have shown them their error.

DEFENDANT'S LICENSE.

If, in some way, it is possible to sustain the patent in suit, and give to Macdonald the status of an original and meri-

torious inventor, the complainant can not prevail here, because it is estopped by a license contract between complainant and defendant made December 7, 1896 (R. pp. 443-447). The purpose of that agreement was "to exchange licenses and to put an end to the large expense of continuing the pending litigation" (R. p. 444. F. 1630). In this agreement it was provided (R. p. 445. F. 1634):

"It is further agreed that neither interest will bring suit against such types of apparatus *or supplies* as have been put out commercially by the other interest *before the date of this contract*, whether put out by either interest before or after this contract."

The testimony shows that the Edison composition has been marketed continuously since 1889 and that it has been manufactured by the metallic aluminum process continuously since October, 1895. Complainant may contend that since the Aylsworth composition, from which molded records are made (Aylsworth patent No. 783,275), was put out after the date of the license agreement, the license can not apply to the same. So far, however, as the Aylsworth composition could be regarded as an infringement, it must be because of its utilization of free stearate acid, stearate of soda, stearate of alumina and ceresin. If, therefore, defendant is licensed to manufacture and sell a composition utilizing these four ingredients alone, obviously its license must extend to the addition of other ingredients which are not suggested in the patent in suit, and which are the subject of an independent patent.

WHILE DEFENDANT'S SECRET PROCESS WAS NOT PATENTED, DEFENDANT HAD A PROPERTY RIGHT THEREIN, AND THIS RIGHT EXTENDED TO ENJOINING ITS DISCLOSURE BY ANY EMPLOYEE OF DEFENDANT AND THE USE OF SUCH PROCESS BY ANYONE TO WHOM IT SHOULD BE DISCLOSED, WITH KNOWLEDGE OF THE RELATION BETWEEN DEFENDANT AND HIS EMPLOYEE.

Cases involving trade secrets are not, like patent suits, confined exclusively to the Courts of the United States, but are reported in a large number of State reports as well. The decisions in this country have followed the decisions of the English Courts. It is, of course, impossible to find any reported case on all fours with that now before the Court, since the peculiar combination of impudence and iniquity necessary to inspire the competitor of the proprietor of a trade secret to acquire the secret from its original discoverer and owner by debauching an employee of the latter, and then, in the meantime having patented the process, to thereafter sue the real originator of the process upon such a patent, is difficult to even imagine. We have made a very thorough and careful investigation with a view to finding if there is any case in which the circumstances here presented are found, but as was naturally expected, such a search has been unsuccessful. The reported cases referred to hereafter show clearly the right of a manufacturer as against a competitor who has wrongfully appropriated one of its trade secrets, but the subsequent patenting of that secret by the competitor followed by suit against its originator, presents an absolutely unique situation for which we find no parallel or analogy.

The leading English case upon the subject of trade secrets (and which has been uniformly followed by the courts of this country, both of the various States and by the Federal Courts as well) is *Morrison vs. Moat*, 9 Hare, 241. That suit arose upon the following state of facts: Morrison, the inventor and sole proprietor of a medicine for which no patent had been obtained, entered into a partnership with Moat, to whom he communicated the secret of making the medicine. But he did not make this secret a part of the assets of the partnership, but reserved it to himself as against all other persons, while Moat covenanted not to reveal it to any other person whatsoever. By subsequent agreement, Morrison's son and a son of Moat were also admitted as partners in the business, and the secret was surreptitiously obtained from Moat by his son. After the death of both the original parties, on a bill brought by Morrison's son—who also was the legatee of the secret—against Moat's son, the latter was restrained by injunction from using the secret in any manner in compounding the medicine, and an injunction against his communication of the secret to others was refused only because no allegation or evidence of his intention to so communicate it was presented to the court.

On appeal (21-L. J. N. S. Ch. 248) Lord Cranworth affirmed the decision below and said:

"The principles that were argued in this case are principles not to be called into controversy. There is no doubt whatever that when a party who has a secret in trade employs a person under a contract *expressed or implied*, such persons cannot gain the knowledge of the secret and then set it up against their employer."

In *Peabody, et al. vs. Norfolk, et al.*, 98 Massachusetts, 452, the case was heard on bill and demurrer, so that the allegations of the bill were taken as true. As alleged in the bill, Peabody was engaged in the manufacture of gunny

cloth by means of secret machinery and processes, which were the outgrowth of years of experiment; and Norfolk, who was a machinist and a confidential employee of Peabody, in the course of this employment, became possessed of the secret of Peabody. Norfolk made a contract with Peabody, not to disclose or use the secrets of the latter, except for his benefit. Norfolk left the employment of Peabody and made arrangements with one Cook to enter into the same business with him and to disclose to him Peabody's secrets of machinery and processes. In the opinion the following language was used:

"It is the policy of the law for the advantage of the public to encourage and protect invention and commercial enterprise. * * * If he invent or discover and keep secret a process of manufacture, whether it be a proper subject for a patent or not, he has not indeed an exclusive right to it as against the public, but he has a property in it, which a court of chancery will protect against one who in violation of contract and breach of confidence undertakes to apply it to his own use, or to disclose it to a third person. * * * Although this process is carried on in a large factory the workmen may not understand or be entrusted with the secret, or may have acquired a knowledge of it upon a like confidence. A secret trade, or manufacture does not lose its character by being confidentially disclosed to agents or servants without whose assistance it could not be made of any value. * * * The supplemental bill alleges and the demurrer admits that Cook with notice of the relations between Peabody and Norfolk has made arrangements to have the secret communicated to him by Norfolk, and together with him to use it for their own benefit. Upon such a state of evidence, Cook has no better equity than Norfolk."

In *Thum Company vs. Tloczynski* (Michigan), 72 N. W., 140, complainants were engaged in the manufacture of sticky fly paper and had been to great trouble to keep their machin-

ery and processes secret. They had gotten their machinery in separate pieces and put it together afterwards themselves and excluded the public from their factory, etc., and in every way made it clear to those who had anything to do with them or knew anything about the business, that they intended and desired to keep it in every respect secret. Defendants, who had been in their employ, and learned their secrets in such employ, intended to communicate these secrets to others, who desired to enter into the business. The bill set up a contract by defendants, not to disclose or practice the secrets of complainant. Apparently, however, the court did not rely to any considerable extent upon this contract, but relied principally upon the confidential relations of the parties and the evident desire of the complainant that the secret should not be communicated. The injunction prayed for was granted and this action was affirmed by the Appellate Court. In the decision on the lower court upon this case, the court, after considering numerous earlier cases, goes on to say:

"But without multiplying citations, or prolonging the consideration of the legal aspect of this case, it may be said by way of conclusion that the principle contended for by complainant is not only abundantly supported by authority, but it is likewise founded in good common sense, and is peculiarly applicable to the case in hand. Here is a party who, by the expenditure of large sums of money and the exercise of large skill and ingenuity, has built up a prosperous business, the capital of which consists largely of inventions and discoveries made by its officers, servants and agents. The world at large knows nothing of these inventions because they are locked within the brains of those who conceived them. The defendants, who have been largely instrumental in perfecting them, while under both express and implied contract to give plaintiff the benefit of their inventive genius, propose now to disregard their legal and moral obligations by creating a new establishment where these inventions and discoveries may be employed

to plaintiff's serious injury. This is not legitimate competition which it is always the policy of the law to protect, but it is *contra bonos mores* and constitutes a breach of trust which a court of law, and much less a court of equity should not tolerate."

In Volume II of Judge Story's Work on Equity, page 952, the following language occurs:

"Courts of equity will restrain a party from making a disclosure of secrets communicated to him in the course of a confidential employment and it matters not in such cases whether the secrets be secrets of trade or secrets of title or any other secrets of the party important to his interests."

Stewart vs. Hook, 45 S. E., 369:

"Independently of patent rights, the discoverer of a medicinal preparation has a property right in his discovery in that he may keep it a secret and those who, through confidential relations to him, gain possession of the secret will be restrained by a court of equity from divulging it so as to make use of it to his detriment."

In *Fralich vs. Despar* (Penn.), 30 Atl., 521, the defendant was employed by complainant in the manufacture of certain oils and greases using complainant's trade secrets in such process and by which means he learned the said secrets. He was under contract not to divulge these secrets or make use thereof except for his employer's benefit, but he thereafter left his employer and made use of the secrets for his own benefit, setting up an independent establishment. This practice was enjoined, the court saying:

"An employee, getting the secrets or a business or trade under such circumstances, and especially under such an agreement, carried out as this was, had no right to use the secrets so obtained for his own private use or reveal them to others."

The cases so far cited have been English cases and cases in State Courts. In the Federal Courts the leading case on this topic is *Simmons Medicine Co. vs. Simmons*, 81 F. R., 163. In that case the defendant's father had sold the secret of a so-called liver medicine to the complainant and defendant himself as an employee of the complainant had had this secret imparted to him and had made a contract with the complainant not to manufacture liver medicine. When he broke this contract and made medicines similar to those of the complainant for sale under his own name, the Court said:

"Having entered the service of complainants and having had imparted to him their secrets, defendant was in equity and good conscience obliged to preserve them as secretly as his own, and this *as well without a contract as with it.*"

Some of the leading decisions upon trade secrets in the United States have been decided in the courts of the State of New Jersey. The first of these cases is *Salamon vs. Hertz, et al.*, 2 Atl., 379. In this case the defendants were employed confidentially by complainant and learned his secrets. The bill charged they were going into business with another in the same line—tanning leather—and were about to disclose and practice his secret processes. The Court said:

"That the facts stated in the bill entitled the complainant to the aid of equity admits of no question. One who invents or discovers a secret process of manufacture, whether patentable or not, has a property right therein which the courts will protect against one who in violation of the contract, or *breach of confidence*, undertakes to apply it to his own use or disclose it to a third person."

A very recent and carefully considered case upon this subject is *Stone, et al., vs. Goss, et al.*, 55 Atlantic, 736, also decided in New Jersey. The complainant in this case was in the business of manufacturing depilatories (compounds for use to remove hair from skin and hides) by means of secret processes. The Grasselli Company, one of the defendants was engaged in the same business, but had been unable to produce as good a product as that made by Stone. Goss had been in the employ of Stone during the time in which the secret processes were developed and knew all about them. The Grasselli Company had Stone's depilatories analyzed and made overtures to Goss to enter into its employ by means of letters and oral interviews. As a result of these negotiations Goss gave Stone notice that he was leaving his employ and thereafter entered into the employ of the Grasselli Company. He did no work during the first two or three weeks of his employment with the Grasselli Company, but immediately upon his employment, Frazier, Superintendent of the Grasselli Company's plant, questioned him in regard to what he knew of the manufacture of depilatories, and Goss informed Frazier of Stone's methods of manufacture and described fully his apparatus. Frazier reported this information to his employers with a sketch of the apparatus and the manner in which it should be made and put up. This sketch was made by Frazier and corrected by Goss. The Grasselli Company approved of Frazier's plan and directed him to put up a shed to contain the apparatus. He was proceeding with this work when stopped by a preliminary injunction. The court said:

"The right of a manufacturer, whose goods are made by an unpatented secret process, to protection by injunction against the divulging of his secret in a proper case, is now established by a well-considered line of cases in England and in several states. The leading case is *Morrison vs. Moat*, 9 Hare, 241, 20 L.

J. Eq., 513, decided by Vice Chancellor Turner in 1851, and affirmed in Court of Appeals by Lord Cranworth, 21 L. J. Ch., 248. The principle has since been applied to cases in various aspects in the English courts. *Merryweather vs. Moore* (1892), 2 Ch., 518, 61 L. J. Eq., 505; *Lamb vs. Evans* (1892), 3 Ch., 462, 61 L. J. Eq., 681, affirmed on appeal, 62 L. J. Eq., 404. A leading case in this country is *Peabody vs. Norfolk*, 98 Mass., 452, 96 Am. Dec., 664. In New York the principle is established in *Tabor vs. Hoffman* 188 N. Y., 30, 23 N. E., 12, 16 Am. St. Rep., 740; *Eastman vs. Reichenback* (Sup.), 20 N. Y., Supp., 110; *National Gum Co. vs. Braendly* (Sup.), 51 N. Y. Supp., 93; *Little vs. Gallus* (Sup.), 57 N. Y. Supp., 104; *Tode vs. Gross*, 127 N. Y., 480, 28 N. E., 469, 13 L. R. A., 652, 24 Am. St. Rep., 475. In Michigan it was adopted in a very well-considered opinion in *O. & W. Thum Co. vs. Tloczynski*, 114 Mich., 149, 72 N. W., 140, 38 L. R. A., 200, 68 Am. St. Rep., 469. In Pennsylvania, *Fralich vs. Despar*, 165 Pa., 24, 30 Atl., 521. In Indiana, *Westervelt vs. National Paper Co.*, 154 Ind., 673, 57 N. E., 552. In the Federal Courts, *C. T. Simmons Medical Co. vs. Simmons* (C. C.), 81, 163. This rule has been applied in this State in the Court of Chancery by Chancellor Runyon in *Salomon vs. Hertz*, 40 N. J. Eq., 400, 2 Atl., 379. *Salomon vs. Hertz*, *Peabody vs. Norfolk*, and *O. & W. Thum Co. vs. Tloczynski* are the leading American cases. These cases establish the principle that employees of one having a trade secret, who are under an express contract, or a contract implied from their confidential relation to their employer, not to disclose that secret, will be enjoined from divulging the same to the injury of their employer, whether before or after they have left his employ; and that other persons who induce the employee to disclose the secret, knowing of his contract not to disclose the same, or knowing that his disclosure is in violation of the confidence reposed in him by his employer, will be enjoined from making any use of the information so obtained, although they might have reached the same re-

sult independently by their own experiments of efforts. We approve the principle thus established.* * * * * The evidence satisfies us that the Grasselli Chemical Company knew that Stone was manufacturing a superior article to its own; that it had been for some time trying to discover Stone's method of manufacture; that it had entered into correspondence with Goss and employed him while he was still in Stone's service; and that, immediately upon his coming into the employ of the defendant company, it sought through Frazier to learn Stone's secret, and, having learned it, was about to make use of it to manufacture a similar substance by Stone's process, to be sold in competition with his. These facts leave no doubt that the Grasselli Chemical Company acted in fraud of Stone's rights in the effort to learn his secret by inducing his employee to divulge the same. Even though they did not know of the contract, they must have known of the confidential character of Stone's business, and the confidential character of the relation between him and his employees. The defendant company is a party to Goss's fraudulent disclosure of the secret, and the complainants were entitled to an injunction restraining the Grasselli Chemical Company from making any use of the information thus obtained from Goss."

Special attention is directed to the following extract from the same opinion, as it not only goes to show that there is a property in trade secrets and that their disclosure by employees and their use by those who learn them fraudulently may be enjoined; but goes much further, even to the extent of affirming that as a result of fraud, they may lose the advantage of further independent work of their own. This, it seems to us, is good sense and good law and applies particularly strongly to the case now under consideration:

"The injunction should not be refused because the process was such that it would probably have been discovered by independent experiments in the manipula-

tion of the ingredients of which the products of both parties were alike composed. The Grasselli Chemical Company, by its own conduct has put itself in such a position that it may even lose the advantage of future independent experiments. It would be quite impossible hereafter to decide how much of the improvement in the product of the Grasselli Chemical Company would be attributable to its own independent efforts, and how much to the knowledge of Stone's process fraudulently acquired by it. Every doubt must be resolved against the parties to a fraudulent act. If the defendant thereby suffers, it suffers only by reason of having been a party to Goss's fraudulent disclosure of the secret."

A third case decided like the two preceding in the Court of Chancery of New Jersey is *Taylor Iron and Steel Co. vs. Nichols, et al.*, 65 Atl., 695. In that case the complainant was engaged in the manufacture of a peculiar grade of manganese steel, at High Bridge, New Jersey. This was made under certain patents to one Hadfield, but in addition to the disclosure of the patents, certain improvements were developed by complainant in the manufacture of its steel, and these were preserved as trade secrets. The American Brake Shoe & Foundry Company, one of the defendants, was organized to manufacture steel in Chicago under the disclosure of the Hadfield patents, which had expired, but this Company was unable to produce steel of sufficiently good quality to compete with the products made at High Bridge, because it did not have knowledge of the trade secrets of complainants. The defendant company accordingly sent one of its officers to the High Bridge plant, and he induced the other defendant in the case, Nichols, to leave the employ of complainant and to go to Chicago and enter the employ of the new company. The circumstances were such that it was evident that the only service that he could render the Chicago Company was to disclose to it the trade secrets of complainant. This suit was brought to prevent

the disclosure of complainant's trade secrets by its former Superintendent, Nichols, and to enjoin the defendant Company from taking Nichols into their employ. Certain contracts between Nichols and the Taylor Company figured in the case, but the decision of the court was not limited to these contracts, for in the course of its opinion the court said:

"The confidential relation existing between Nichols and his employer was such as to raise an *implied promise* that he would not disclose such of them (the secrets of trade) as he learned or was taught when in complainant's employ."

The court granted both the prayers of the bill and cited with approval that portion of the decision in the case of *Stone vs. Grasselli Chemical Company*, 55 Atlantic, 726, where it was held that one who fraudulently appropriates the trade secrets of a competitor, may as a result of that fraudulent act in the beginning of his operations, lose the right to improvements which he himself may make thereafter. The following is an extract from the opinion:

"There can be no doubt, it seems to me, that to permit the defendant corporation to employ Nichols, notwithstanding he may be enjoined from disclosing complainant's secret methods and processes, would afford it an easy opportunity to obtain from Nichols, in spite of the injunction against him, the knowledge which they seek, and which could be so used as to make discovery very difficult, if not impossible. The persistent effort to obtain the services of Nichols, whose only special qualification is his knowledge of the complainant's secrets, warrants the court in preventing, as far as possible, the success of this attempt to induce a trusted servant to commit a breach of confidence by the disclosure of complainant's secrets. If the defendant corporation suffers any injury in being denied the right to employ Nichols in work that does not require

a disclosure of complainant's secrets, it is an injury resulting from an inequitable attempt to injure the complainant, and, if a defendant, by its own conduct, can put itself in such a position as to lose the advantage of future independent experiments, as was held in *Stone vs. Grasselli Chemical Co.*, 65 N. J. Eq., 756-762, 55 Atl., 736, 63 L. R. A., 344, 103 Am. St. Rep., 794, a defendant may, in my opinion, be denied the right to take into its employment for any purpose, one whom the court is satisfied has been enticed to leave his master under such conditions as to justify the conclusion that the ulterior purpose of the employment is to acquire the trade secrets of his master."

From this review of the decisions on the subject, it will be clear that the theory on which the courts have proceeded in this class of cases is that the divulging of trade secrets by employees of the proprietor thereof, and their appropriation by third parties when acquired from such employees, are frauds practiced upon the proprietor. Complainant has clearly practiced a fraud upon defendant and under the decisions, defendant would have been justified in proceeding in equity against complainant because of its fraudulent doings. At the time the Macdonald patent was taken out defendant had no knowledge of the unfair and fraudulent practices of complainant, and it was not until this suit was brought by complainant many years after the granting of the patent, that defendant, in collecting proofs for its defense, learned of complainant's reprehensible conduct. Whether such a suit should now be brought is a question for independent consideration.

However, independent of any affirmative relief which may be hereafter granted to defendant, the cases which have been reviewed clearly establish the property right of defendant which has been wrongfully and fraudulently invaded by complainant. Occupying this position, Complainant certainly has no standing in a court of equity.

THE TRUE AND FIRST INVENTOR, AND NO ONE ELSE, IS ENTITLED TO A PATENT, NOTWITHSTANDING HIS EMPLOYMENT BY ANOTHER OR THE MERE SUGGESTION OF THE RESULT DESIRED TO BE ACCOMPLISHED MADE TO HIM BY ANOTHER.

Complainant, as we have pointed out, will no doubt contend that Macdonald is entitled to patent as his own invention the composition as produced by Melzer on the theory that Melzer was the employee of Macdonald and merely carried the latter's ideas into execution. But the proofs clearly show that Melzer was an independent inventor. The doctrine that an employer is entitled to patent in his own name the inventions of his employee is strictly limited to two cases—(1) where the employee carries out the idea of his employer and (2) where the employee in the course of his work makes slight auxiliary inventions, merely contributory to the work which the employer has conceived. But neither of these cases is presented here, and as between Macdonald and Melzer, the latter was the only one who invented the composition.

In *Agawam Woolen Company vs. Jordan*, 7 Wall, 583-610, the leading case on this point, the court said:

"Where a person has discovered an improved principle in a machine, manufacture or composition of matter, and employs other persons to assist him in carrying out that principle, and they, in the course of experiment arising from that employment, make valuable discoveries ancillary to the plan and preconceived design of the employer, such suggested improvements are in general to be regarded as the property of the party who discovered the original improved principle, and may be embodied in his patent as a part of his invention. * * * * * But where the suggestions go to

make up a complete and perfect machine, embracing the substance of all that is embodied in the patent subsequently issued to the party to whom the suggestions were made, the patent is invalid, because the real invention or discovery belonged to another."

Alden vs. Dewey, Federal Cases, No. 153, Circuit Court for the District of Massachusetts. The defense was that the improvement of the patent was not original with the patentee. In support of this defense, the evidence showed that one Draper suggested to the patentee that the nib for a scythe snath which furnished the grip, should be secured by a screw instead of by wedges, as had been done theretofore. Story, J., charged the jury as follows:

"Did Draper communicate to Pierce substantially the improvement for which he took out his patent, so that without more inventive power Pierce could have applied it? It was not enough that Draper gave a hint, nor on the other hand was it necessary that he should communicate every minute thing about the invention, but he must have communicated the substance."

The jury found for complainant, thereby holding that the mere suggestion made by Draper to Pierce was not a communication of the substance of the invention.

Pitts vs. Hall, Federal Cases, No. 11,192, Circuit Court for Northern District of New York. In this case the defense was interposed that the invention had been made by another than the patentee. Nelson, J., charged the jury:

"A person to be entitled to the character of an inventor within the meaning of the act of Congress must himself have conceived the idea embodied in his improvement. It must be the product of his own mind and genius and not of another's. * * * * To invalidate a patent on the ground that the patentee did not conceive the idea embodied in the improvement, it must appear that the suggestions, if any, made to him by

others, would furnish all the information necessary to enable him to construct the improvement, * * * * * If after all the suggestions, there was something left for him to devise and work out by his own skill or ingenuity in order to complete the arrangement, then he is in contemplation of law to be regarded as the first and original discoverer. On the other hand the converse of the proposition is equally true. If the suggestion or communications of another go to make up a complete and perfect machine embodying all that is embraced in the patent, subsequently issued to the party to whom the suggestions were made, the patent is invalid, because the real discovery belongs to another."

In *Damon & Bihn vs. Eastwick*, 14 Fed. 40, Circuit Court for the Eastern District of Pennsylvania, it was held by Butler, J., that the actual discoverer of a process is entitled to a patent as against his employer at whose request and expense he works in making the discovery.

In *Union Paper Collar Company vs. Van Dusen*, 5 Fisher Patent Cases, page 597, the claim in issue was for a paper collar made from a certain paper manufactured from stock of long fibre. By using paper of this nature the patentee was able to make a paper collar which could be bent to form and was useful for wear. The court said:

"Whatever invention there was in the premises was an invention of the paper possessing the described properties. No person can be considered an inventor of the paper who did not invent the process for making the paper. It is entirely clear from the evidence that Evans (the patentee) had nothing to do with the process for producing the paper. Mr. Crane and his operatives worked out that process without any suggestions from Evans as to any parts of the process. All that Evans did was to say that he must have a paper of a certain weight, thickness, color, strength and finish. Such a paper was produced by Crane after many

experiments as to the character of the materials used and the mode of treating them. * * * * Evans, not having invented the paper was not entitled to a patent for it, or for the collar to be made from it.

"The broad proposition is contended for by the plaintiffs, that Evans invented the paper as a new manufacture, because he was the first to conceive the idea of having a paper combining all the qualities prescribed in the specification. It is urged that as he was not a paper maker, he had a right to use the trained skill of Mr. Crane and his operatives to carry out the idea and they were merely the instrument of Mr. Evans in working out the invention of Evans. * * * * *

"Evans had nothing to do with imparting to the paper the quality attributed to it by the specification. He merely announced to the paper maker that he desired a paper having those qualities to be made. If the paper maker * * * * * claimed a patent for the paper, as having invented the process by which it was made, could it be said that he would not have been entitled to such a patent? If not, can Evans be entitled to a patent for the paper or to the present patent, which is really nothing else but a patent for the paper? At the very utmost Evans could properly assert nothing more than that he and the paper maker were joint inventors of the paper. For these reasons I am constrained to hold that the reissue, No. 2,309, is void."

There have been a great many cases in the Patent Office, and in the Court of Appeals for the District of Columbia, to which appeals are taken from the Patent Office, respecting priority of invention, and in many cases the awarding of priority is determined by discovering who was the originator of the invention. In other words, it becomes a question of originality instead of priority. Two cases of this sort will serve to illustrate the attitude of the Court of Appeals on this subject:

Sendelbach vs. Gillette, 109 O. G., 276, C. D. 1904,
page 597:

"The law upon the subject is well settled by repeated decisions of the Supreme Court of the United States. Where a party claims an invention, and also to have communicated that invention to another, who has applied mechanical work thereto, and put such invention in practice, claiming the same as his own, the communication, in order to be effectual must be shown to have been full and clear as to all the essential elements of the invention, and such as was sufficient in itself to enable the party to whom the disclosure was made to give the invention practical form and effect without the exercise of invention on his part. In other words, his work in giving form and effect to the invention communicated must be nothing more than the exercise of mechanical skill as applied to the subject matter. If the work embodies invention as distinguished from mechanical skill, it can not be successfully claimed by another except where there has been an agreement that such completed invention, or the patent therefor, shall inure to the benefit of the party making the communication."

Robinson vs. McCormick, 128 O. G., 3289 (Court of Appeals, D. C.).

McCormick had a conception of a somewhat complicated automatic indicator for a file holder, and he disclosed this to Lumbard, who independently produced a different indicator, very much less complicated and cheaper to construct. The following extracts from the opinion are pertinent:

"The substantial question for determination is this: Does the benefit of the reduction to practice of Lumbard's construction in December, 1903, inure to McCormick.

"Regarding the two as occupying substantially the relation of employer and employee at the time, the well

established principle is applied; that an inventor who employs another to embody his conception in practical form is entitled to any improvement thereon due to the mechanical skill of the employee. The latter must invent something, not merely improve, by the exercise of mechanical skill, upon a conception which he has been employed to work out. (Agawam vs. Jordan, 7 Wall., 583, 603; Milton vs. Kingsley, 7 App. D. C., 531, 537; Huebel vs. Bernard, 15 App. D. C., 510, 514; Gedge vs. Cromwell, 19 App. D. C., 192, 198; Gallagher vs. Hastings, 21 App., D. C., 88, 99; Flather vs. Weber, *iden.*, 179; Sendelbach vs. Gillette, 22 App., D. C., 168, 177.) The reason for this rule is obvious. Inventors are often compelled to have their conceptions embodied in construction by skilled mechanics or manufacturers, whose practical knowledge often enables them to suggest and make valuable improvements in simplifying and perfecting machines or devices. These are things they are employed and paid to do. The inventor is entitled to protection from their efforts to claim his invention. At the same time an employee is to be protected from the rapacity of his employer also; and if in doing the work assigned him, he goes farther than mechanical skill enables him to do, and makes an actual invention, he is equally entitled to the benefit of his invention. Necessarily the relations between them generally impose upon him the burden of showing that he has made an invention in fact. *To claim the benefit of the employee's skill and achievement it is not sufficient that the employer had in mind a desired result, and employed one to devise means for its accomplishment. He must show that he had an idea of the means to accomplish the particular result, which he communicated to the employees, in such detail as to enable the latter to embody the same in some practical form.* Tested by these principles we are of the opinion that the construction of Lombard was more than a mechanical improvement upon the idea of means communicated to him by McCormick. * * * * * McCormick had no idea at that time of attaching the indicator to the file holder itself. This was the con-

ception of Lumbard. He rejected the complicated and expensive combination of McCormick and devised a simple "flap" or "flipper" for attachment to the file-holder itself, which was automatically operated whenever the cover of the file-holder was raised or turned back to deposit a slip. * * * * * Whether, then, Lumbard be regarded as the employee of McCormick, or his partner, or as a mere stock-holder of the same corporation, which was the actual relation, we are of the opinion that he must be held to be the inventor of the automatic indicator attached to the file-holder, as shown in his construction.

"If Lumbard had proceeded with his application, and been included in an interference with McCormick, he would be regarded as an independent inventor and not a mechanical developer and improver of an idea of means disclosed by the latter. In such case his reduction to practice would not, of course, be available by McCormick."

See also *Shuman vs. Beall, Jr.*, 123 O. G., 1664 (Ct. App. D. C.).

TO PERCEIVE A NEED AND EXPERIMENT WITH A VIEW TO FINDING MEANS FOR SUPPLYING THAT NEED, WHERE THE EXPERIMENT ENDS IN FAILURE, IS NOT A CONCEPTION OF AN INVENTION.

Macdonald apparently knew the qualities which the desired composition should have, because he had made a study of the Edison composition. He tried long and diligently to obtain that composition, but unsuccessfully. When he did finally get it, it was supplied to him by others. What Macdonald did, did not amount even to a conception of the invention for he had an idea only of the end to be accomplished and not of the means for doing it. It was this end or purpose and this alone that he imparted to Melzer.

"He who perceives these new necessities and satisfactions, and devises a means by which the state of satisfaction is substituted for the state of want, is a true inventor, but he who merely sees the want and its antithesis performs no part of the inventive act." Robinson on Patents, Volume I, page 134-5-5.

"To perceive an existing want, to conceive that in some way it may be supplied, even to discover what attributes an article or operation must possess in order to relieve the want—neither of these acts results in an idea of means by which the want may be removed. To apprehend the qualities of a given substance, to conclude either from reasoning or observation that it might be usefully applied to a given purpose, falls also short of the conception of an idea of means. The creative process of the inventor must go far beyond these achievements, it must not only discern the want, the possibility of its supply and the attributes with which the article or operation that supplies it must be endowed, but it must produce the art or instrument itself ready for application to the removal of the want. It must bring into actual contact with its object the force now latent in the given substance, and thus fulfill the purpose whose possibility the inventor as yet only perceives. When the idea has reached this point it is the idea of an invention. Before this it is merely an empty speculation, or a fact in nature open to the perception of all mankind." *Ibid*, page 532.

Bell vs. Brooks, 19 O. G., 290; C. D. 1881, page 4. This was an interference decided by the Commissioner of Patents during the time when, by the statutes, the Commissioner's decision was final in such cases.

Brooks proved conception in July and Bell proved a conception in August. The invention was the combination of a telephone wire with an additional wire running parallel therewith and in close proximity thereto and insulated therefrom. The trouble with the telephone had been that there was a hissing and rattling noise present when the single

wire line was used with the ground for a return circuit. The preceding year Bell had recognized this defect in the telephone and had made experiments with a view to its elimination. Thinking that the difficulty was due to induction from neighboring telegraph lines, he experimented with an all wire circuit, but without getting rid of the trouble, and he came to the conclusion that perhaps the trouble was not due to induction. It was not until August that he realized that it was necessary to have the two parts of the wire circuit at substantially the same distance from each other throughout their length, and the Commissioner held that he could not have any date earlier than August as a date of conception, the prior recognition of the difficulty and need, and his experiments with a view to doing away with the difficulty, not being sufficient to show a conception of the invention.

IF A PATENTED INVENTION WAS KNOWN OR
USED BEFORE ITS INVENTION OR DISCOVERY
BY THE PATENTEE, THEN THE PATENT IS IN-
VALID.

The composition covered by the patent in suit was known and used by defendant for more than seven years before the patent was applied for. In the course of defendant's factory operations, several persons, among them Edison, Aylsworth, Miller, Aschenger and Higgins, knew and used this composition and practiced the process of making it. The patent is therefore for this reason invalid.

Sec. 4886, R. S., provides that:

"Any person who has invented or discovered any new and useful art, machine manufacture or composition of matter, * * * not *known or used* by others in this country before his invention or discovery thereof * * * shall obtain a patent therefor."

Should complainant contend that prior knowledge or use refers only to a public knowledge or use, attention is called to the decision in *Shaw vs. Cooper*, 7 Pet., 292, which was an appeal to the Supreme Court of the United States from the Circuit Court of the Southern District of New York. In that case McLean, J., in defining public use, said:

"The knowledge or use spoken of in the Act of 1793 could have referred to the public only, for the provision would be nugatory if it were applied to the inventor himself."

It is evident that this language can mean only that "the public" is anyone except the inventor himself. The same thing is apparent from the frequently quoted decisions in *Bedford vs. Hunt*, 1 Mas. 302, where it was said:

"If the first inventor reduced his theory to practice and put his machine or other invention into use, the law would never intend that the greater or less use in which it might be, or the more or less widely the knowledge of its use might circulate, should constitute the criterion by which to decide upon the validity of any subsequent patent for the invention. A patent may, therefore, be defeated by showing that the thing secured by the patent had been discovered and put into actual use prior to the discovery of the patentee, *however limited the use or knowledge of the discovery may have been.*"

Gayler vs. Wilder, 10 How., 477, is a case which is frequently cited in support of the proposition that a patent may be valid, although there was a prior use or knowledge thereof. As a matter of fact, this case does not support any such proposition, the only point decided in the case being that, if the former invention had gone out of the mind of its inventor so that it had become a lost art, a subsequent independent inventor might obtain a valid patent for it. The following extract from the decision of the Court shows clearly what was decided in that case:

"We do not understand the Circuit Court to have said that the omission of Conner to try the value of his safe by proper tests would deprive it of its priority, nor *his omission to bring it into public use*. He might have omitted both, and also abandoned its use and been ignorant of the extent of its value, yet if it was the same with Fitzgerald, the latter would not upon such grounds be entitled to a patent, provided Conner's safe and its mode of construction were still in the memory of Conner before they were recalled by Fitzgerald's patent."

In *Coffin vs. Ogden*, 18 Wall., 120, the Supreme Court decided that prior knowledge or use by a single person was sufficient to invalidate a subsequent patent, citing *Bedford vs. Hunt*, *supra*. In this decision it was suggested that the exception noted in *Gayler vs. Wilder*, *supra*, as in the case of lost art or an analogous case, was perhaps incorrect, and that even in case the prior invention was a lost art, a later patent would still be invalid.

In *Hall vs. McNeale*, 107 U. S., 90, the Court went very far toward deciding that a mere previous knowledge was all that was necessary, and that a prior use, even if secret, would invalidate a later patent. The patent in suit was for a safe, and had to do with the interior construction thereof, which was hidden in the completed safe. But the Court said that it was not necessary to wait until a burglar tried to get into the safe to test it, but this was such a use as comported with the actual use of the safe, and anticipated the later patent.

The Circuit Court shortly thereafter went still further, holding that a use, even if secret, invalidates, since the statutes only required a prior use. This was the case of *Reed vs. Cutter*, Federal Case No. 11,645 (found also in 1 Story, 590, and cited in Walker on Patents, paragraph 71) in which it was decided that no person not the first inventor can have a valid patent, even if the first inventor keeps his invention secret, and the court said further that the provision of the

statute "not known or used by others" does not require more than one person to constitute the *others*.

In *Rich vs. Lippincott*, Fed. Cas., No. 11,758, it was held that any prior use or knowledge invalidates the later patent, even if the use of the earlier invention is abandoned, except where it is a lost art, as in the case of *Gaylor vs. Wilder*, *supra*.

In *Daniel vs. Restein & Co.*, 131 Fed. Rep., p. 469, the invention of the patent in issue was a packing and the defense was that the patent was invalid because of the former use of the invention. To this it was replied that the former packing did not go into general use or become a commercial factor. It appeared, however, that the reason for this was that it was not cheap enough and although it was a good packing, it was rather expensive. The court held that this was an anticipation since prior knowledge and use by a single person had been held to negative invention in *Coffin vs. Ogden*, *ubi. supra*.

In *Kelleher vs. Darling*, Fed. Cas. No. 7,653, Clifford, J., in the United States Circuit Court for the District of Maine, held that:

"Due proof of prior invention and practical use by another is sufficient to defeat the right of the applicant for a patent, because it shows that he is not the original and first inventor of the alleged improvement. Even if the prior invention was only made and used for a day, if it clearly appears that it was operative, and that it was actually reduced to practice, the rule being one of actual priority as defined by the rules of law and evidence. * * * The gist of the defense is that the invention was first made and reduced to practice by another."

Stitt vs. Eastern R. R. Co., 22 Fed., 649, Circuit Court for the District of Massachusetts, Colt, J. Eight years before the patent in suit was issued cars embodying its invention were ordered and drawings thereof were sent from

South America to the car works at Portland, Maine. The cars were made up at Portland, but were not tried or used there and were shipped to South America. It was held that the primary inquiry is identity. "Use may not be necessary to show this, and is not in this case. The patent is invalid."

Shoup vs. Henrici, Fed. Case, 12,814 (Circuit Court for the Western District of Pennsylvania, McKennan, Judge), is authority for the proposition that a device once made and used, although abandoned, cannot be exclusively appropriated by any subsequent inventor.

In *Sayles vs. Chicago*, Fed. Cas. No. 12,415, Northern District of Illinois, decided in 1871, the suit was on a patent for a railway brake. The defense was the use of a similar brake long before the patent. This defense was held not to be established, but the question was asked and answered as to what extent a brake need be used to constitute an anticipation. The answer was said to be:

"Until that which is claimed as new in the patent is complete, although the thing may have been imperfect as an instrument or a machine. If it were manifest that the thing claimed in the patent was accomplished, one use would be sufficient. If the construction of the thing itself demonstrated that it was within the principle here stated then perhaps no use need be established."

Jones vs. Barker, 11 Fed., 597, is of interest in this connection. The patent was for a knife for cutting corn from the ear for canning. The anticipation set up was by a former patent, but this important distinction is drawn in the opinion:

"Public use in the sense of the patent law is proved by a single use by any person not the inventor or by the inventor in an open way, provided the use is not experimental."

Buser vs. Novelty Co., 151 Federal, 478, decided by the Circuit Court of Appeals of the Sixth Circuit on appeal from

the Circuit Court for the Southern District of Ohio, Cochran, J., is a very recent case along this line which cites with approval many of the cases already discussed. The invention in issue was a machine for upholstering furniture. The defense was prior use by the defendant for a period of twenty-two years. The machine relied upon as an anticipation was placed in evidence, and it was held that it was not an abandoned experiment, but was at the most an invention abandoned after its completion. The complainant contended that this use was practically a lost art under the decision in *Galyer vs. Wilder*, *supra*, but nevertheless the patent was decided to be invalid. All the evidence regarding this machine appears to have been given by the defendant or his employees, so that as far as can be determined from the opinion, the use of the anticipating machine was to all effects and purposes a secret use.

In *National Phonograph Co. vs. Lambert Co.*, 142 Fed., 164, the Circuit Court of Appeals for the Seventh Circuit, Seaman, J., held that the secret use of a process in commercial operations for eight years without change when the product goes into public use, is a public use of the process and will invalidate a patent therefor. The use considered in that case is precisely the use or is very closely related to the use of the process which is in issue in the present case. While defendant's composition may have been known only to those who made use of it in the factory, the records and blanks made from it were sold in large quantities to the public, many thousands having been sold to complainant alone.

See also:

Dalby vs. Lyons, 64 Fed., 376.

Miller vs. Foree, 116 U. S., 22.

Brush vs. Condit, 132 U. S., 39.

New England Co. vs. Sturtevant Co., 150 Fed., 131
(C. C. A., 2d Circuit, Lacombe, J.).

Parker vs. Ferguson, Fed. Case, No. 10,733, and

United Shoe Machinery Co. vs. Greenman, 145 F.
R., 538.

WHERE A PATENT IS FOR THE INVENTION OF
ANOTHER THAN THE PATENTEE, THE PAT-
ENT IS VOID. FRAUD, ATTEMPTED, OR AC-
COMPLISHED, IS IMPORTANT IN DETER-
MINING WHO IS THE REAL INVENTOR.

The decisions which have been discussed, relating to trade secrets, hinge on two main points: that the composition of defendant was a secret composition and that it was fraudulently appropriated, in whole or in part, by complainant. If defendant's composition had been known to the public, or if it were a secret and complainant found out its nature by legitimate means, complainant could have manufactured this composition without let or hindrance from defendant. But when defendant's factory superintendent, Macdonald, undertook to patent the composition, a different phase of the subject was presented. His patent is void if for the invention of another, whether or not the nature of the composition was a trade secret, and whether he found it out fraudulently or otherwise. This being so, the additional fact that Macdonald surreptitiously acquired the composition from defendant, while not essential to the determination of the invalidity of the patent, serves to make a stronger case against him. The cases cited below show the tendency of the courts in this direction.

Eck vs. Kutz, 132 Fed., 758. There was evidence in this case that Eck's invention was disclosed by spies to the *Boss Knitting Machine Company*. The ideas of the Court on this point are expressed in the following language, and, although the decision did not turn on this particular point, still it is indicative of what that Court would have done had the situation presented here been before it:

"It is no credit to the members of that company that they were ready to avail themselves of Deininger's

offer to sell the information which he claimed to have as to certain improvements which Eck had in contemplation, and it is undisputed that they paid him money and took him to their Patent Solicitor at Washington while he was in Eck's employ and confidence. But whether they repented of it, or whether Deininger—imposter as well as informer—had little or nothing to disclose, particularly after Eck had found him out and discharged him, they threw him over in the end, and made a clean breast of the matter to Eck, to whom Deininger, also, meanwhile, had confessed. While, as it turned out, the incident is without significance, such an attempted theft of the ideas of another, as is indisputably shown, *would warrant the most extreme presumptions if there was occasion to apply them.*"

Standard Cartridge Company vs. Peters Cartridge Company, 77 F. R., 630. In the prior cartridge loading machines, a round conveyor table had been used for carrying the cartridge shell beneath the loading tools, so that these tools had to be placed in the arc of the circle. The invention in controversy was for a loading machine embodying an endless chain carrier with which it was possible to place the loading tools in a straight line.

Ligowsky conceived the invention in 1887 and made numerous sketches of it, which he exhibited and explained to others among whom was Hisey. Hisey claimed, but the Court said it did not believe him, that Ligowsky had never disclosed the invention to him, but that he, Hisey, conceived it independently in 1888. Hisey applied for a patent in 1888 and Ligowsky applied for a patent some time thereafter, and they were placed in interference in the Patent Office. Ligowsky having won the interference, Hisey's assignee brought suit under the interfering patent section of the statutes. The decision of the court, like that of the Patent Office, was in favor of Ligowsky. The following is an extract from the decision:

"If in fact Ligowsky had in 1887 such a full and adequate conception of this invention and disclosed it to Hisey, the question as to whether he used reasonable diligence in perfecting his drawings or building a machine, or applying for a patent, is a matter of no importance as the matter now stands on this bill. Hisey's case must stand or fall upon the question as to whether he is the sole and first inventor. If, in fact, he has only appropriated the conception of Ligowsky, it is of no moment that he made the first machine or filed the first application for a patent. Ligowsky's neglect to push his conception to completion at an earlier date or file an application more promptly, is of no avail to the complainants, if Hisey derived his knowledge of the improvements here involved, from Ligowsky. * * * If Ligowsky's conception was at that time sufficiently developed and perfected to enable one familiar with the construction and operation of the old type of machine to construct a cartridge loading machine embodying the novel features described in the interference issue, by the exercise of mechanical skill and without further invention, he, and he alone, is the first inventor, and Hisey is merely attempting to appropriate the conception of Logowsky."

See also *Hovey vs. Stevens*, Fed. Cas. No. 6,745.

CONCLUSION.

We confidently ask that the bill be dismissed with costs to defendant; and we renew our suggestion that in view of the unwarranted and iniquitous character of the action, complainant be substantially fined.

FRANK L. DYER,
MELVILLE CHURCH,
For Defendant.

United States Circuit Court

DISTRICT OF NEW JERSEY

AMERICAN GRAPHOPHONE CO.

Complainant

vs.

NATIONAL PHONOGRAPH CO.

Defendant

IN EQUITY No. 10

ON PATENT

No. 606,725

ARGUMENTS OF FRANK L. DYER, ESQ., and
MELVILLE CHURCH, ESQ., for Defendant

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United States Circuit Court
DISTRICT OF NEW JERSEY.

Before the Honorable William N. Lanning.

AMERICAN GRAPHOPHONE COMPANY	} <i>In Equity</i> No. 10 <i>On Patent No.</i> 606,725.
<i>vs.</i>	
NATIONAL PHONOGRAPH COMPANY.	

TRENTON, New Jersey, April 1, 1908.

ARGUMENT OF FRANK L. DYER, ESQ., FOR
DEFENDANT.

Mr. Massie having opened the case for complainant, Mr. Dyer, speaking for the defendant, said:

If the Court please, defendant regards this case as an imposition on the Court. In an active practice of over fifteen years, I have never encountered a case that presented the outrageous features of this suit, and I think, when I have made defendant's position clear to your Honor, the Court will be justified in regarding this case as a contempt and in imposing a substantial fine on the complainant for taking up the time of the Court in a matter which is so absolutely devoid of equity.

The parties presented here are, on the one side, the phonograph companies, the so-called Edison in-

terests; and on the other side, the so-called graphophone companies; and which have been occupying the attention of the Federal Courts for a good many years over their patent litigations.

In 1888 both companies were in existence and were making their respective machines and records, the phonograph company using the comparatively thick blank of this character (exhibiting to the Court defendant's Exhibit Ceresin Blank), which could be shaved off and recorded upon successively, and the graphophone company using a very thin blank consisting of wax coated on a paper tube, and capable of having but one record made upon it. The materials used by the phonograph company were ordinary waxes, like ceresin and carnauba wax, and by the graphophone company the same kind of material. These were soft and capable of being cut without difficulty, but were generally objectionable. The art required a more perfect composition on which a phonograph record could be made, and the development of that composition was turned over to Mr. Aylsworth, who is, without doubt, the ablest man in this particular art in the world to-day. Aylsworth gives a very long and interesting deposition illustrating the development of this composition. At first, by a great many hundreds of experiments, various compositions were made from natural waxes; all kinds of combinations of those waxes and all kinds of proportions were tried. That is the way all the work is done in the Edison laboratory. It is not a question of sudden inspiration, but of hammering a thing out by painstaking and long continued experiments, so that nothing will be missed. He made over eight hundred different experiments in combinations of these natural waxes without reaching satisfactory results. Then Mr. Aylsworth, probably at the suggestion of Mr. Edison, determined to produce an artificial wax-like material, or

a soap, and various fatty acids were used for making this soap, the most prominent of which was stearic acid. Stearic acid, as Mr. Massie has said, is the material that is used as the basis of candle manufacture. It is a white substance, as the Court will see from this sample I have in my hand (at this point Mr. Dyer exhibited to the Court a specimen of stearic acid, enclosed within a vial). The stearic acid is saponified by the addition of caustic soda. The first experiments with this artificial wax-like material made by Mr. Aylsworth were in connection with hydrated soaps. The procedure he adopted was this—the stearic acid was melted and caustic soda in the form of lye was added to it so as to saponify the stearic acid, which resulted in the production of stearate of soda. In other words, a chemical reaction was effected between the alkali and the fatty acids, producing stearate of soda, which is a very hard body. Then that stearate of soda was precipitated by the addition of a metallic salt, such as acetate of lead, resulting in the production of stearate of lead, which is a very hard metallic soap. Aylsworth describes hundreds of these metallic stearates, which he added to other wax-like bodies, such as ceresin, ozokerite and paraffine. He conducted an enormous number of experiments along these lines before reaching what he considered a satisfactory composition. In these experiments he made an observation which is of importance here in connection with this patent, because it is one of the discoveries that Macdonald claims to have made.

The Court: Aylsworth did?

Mr. Dyer: Aylsworth did.

I refer to Aylsworth's original note on page 6 of my brief; I will not take your Honor's time to read it, but it says in substance that he observed that glycerine in these materials is extremely objection-

able; that nothing must be used containing glycerine; that if glycerine appears in the material it will make an unsatisfactory composition.

The next step that was taken by Aylsworth was to produce stearate of soda by simply saponifying the stearic acid with caustic soda, with an excess of free stearic acid; *that is to say, the entire stearic acid was not completely saponified.* That is important, because if you make the stearate of soda by complete saponification, it is almost non-fusible, and it is necessary in this art to have a material which can be melted and poured into moulds for the production of these blanks. That was a very important observation which was made by Mr. Aylsworth and was referred to in his notes as follows:

"Stearate of Soda.

Made by adding dissolved caustic soda to melted stearic acid. It must be added slowly to the acid, and after same is added the higher stearate formed *is allowed to dissolve in the stearic acid*, more heat being applied as the melting point of the mass raises or as more soda is combined with the stearic acid." (Brief page 7.)

That is the basis of the modern recording material and that observation was made by Mr. Aylsworth in 1888. That was the foundation on which the recording material has ever since rested, the starting point from which it has subsequently always been made, as I will show your Honor by referring to Mr. Aylsworth's latter experiments. One defect in that particular material considered alone, noted by Mr. Aylsworth, was that *it was very crystalline*; that although the outer surface was more or less amorphous, the material as a whole was very crystalline, and it was therefore necessary to overcome in some way that crystallization; and to ac-

comply that result was the next step taken. His testimony continues as follows:

"The product as obtained gave great promise because of fine record making qualities which the material possessed, but it had this objection that *it was very crystalline*, and it was only with great care that enough amorphous surface could be obtained to take the record on in order to test. I remember, however, that this material was far more easily molded than previous compositions, and that if these difficulties could be obviated (I refer to the crystalline properties) that it might make a very promising material."

The first experiments made by Mr. Aylsworth were in the production of these metallic soaps, and having made these to the extent of many hundreds, he recalled that stearate of alumina is an extremely viscid or sticky material, and he reasoned that if he should add stearate of alumina in a very small proportion to the stearate of soda he would correct that tendency of crystallization, and that was done.

The Court: In the place of stearate of lead?

Mr. Dyer: In the place of stearate of lead. Therefore, *the next step consisted in introducing into this composition stearate of alumina*. That was done originally by adding an aluminum salt, such as acetate of alumina, to the caustic soda, forming aluminate of soda; that is to say, a solution of caustic soda and aluminate of soda, and then the caustic soda with the aluminate of soda dissolved in it was added to the stearic acid and resulted in the partial saponification of the stearic acid and also brought about a reaction between the alumina and stearic acid, forming stearate of alumina. It was found that a very small amount was sufficient. Mr. Aylsworth says, I think, that less than one-tenth of one per cent. of aluminum in this composition perfectly

corrected the tendency to crystallization. That was the important, the very remarkable, discovery that was then made—the turning point around which all the facts in this case circle—the discovery that aluminum of all metals, added in minute proportions, would correct the tendency of the stearate of soda to crystallization—the stearate of soda being the desirable thing.

The Court: When did he make that discovery?

Mr. Dyer: In 1888.

The Court: As early as that?

Mr. Dyer: As early as that. The record shows that experiment No. 871, which is composed of stearic acid, stearate of soda and stearate of alumina, was adopted by the Edison Phonograph Works as its regular composition in place of the previous wax-like material, such as ozokerite or ceresin, that they had been using.

The Court: Experiment No. 1, did you say?

Mr. Dyer: No, sir. Number 871. There had been eight hundred and seventy experiments made along this line before that time.

I am running rather hurriedly over the facts, because there are so many that if I attempted to refer to the record in support of each statement it would be interminable, but the proper citations will be found in the brief. However, the record shows that Mr. Aylsworth regarded that as almost perfection, as he stated in his note book at the time, but it was found to be too hard for the shaving knives then used. At that time steel shaving knives were used. At the present time we use sapphire knives, which are very much harder. So that the next step made was to *slightly soften* the composition—it was too hard, and to that end a very small proportion of oleic acid or red oil, so called, was added to the com-

position, resulting in the production of No. 957, which was adopted as regular, and large numbers of these records and blanks were turned out. In the summer of 1889 trouble was experienced with this composition. Many thousands had been sold and they began to come back for the reason that the surface had become corroded and sweated, as the record says; and Mr. Aylsworth then discovered—and this is another important point—that the trouble was that the oleic acid he had introduced resulted in the formation of oleate of soda, which was more or less soluble and tended to be dissolved by the atmospheric moisture so as to affect the surface of these blanks. Having made this observation, that oleic acid was improper as a material for use in the composition, all of these blanks using oleic acid were recalled and he began to look for another material which could be used to soften the composition. He then discovered that the material *par excellence* was ceresin, which had been previously used alone or in combination with carnauba wax. Ceresin is a wax-like material similar to paraffin. That was in about August, 1889, and the addition of ceresin resulted in the completion of the composition.

That has always been the composition; that is the composition which has never been improved and which Mr. Edison says cannot possibly be improved, because it has all the essentials necessary for this particular art. It is a composition composed in the first place of stearate of soda; that stearate of soda melts with too much difficulty and is therefore dissolved in a certain proportion of stearic acid, the proportions being generally about one-half stearic acid and one-half stearate of soda; stearate of soda is too crystalline; therefore, to correct that tendency, a very minute portion of stearate of alumina is added, and in order to properly temper the material a definite proportion of ceresin is added,

which may vary according to the required hardness. (Handing sample to the Court.) This is a sample of stearate of soda exhibiting the crystalline tendency. The outer surface is quite smooth and amorphous, but the interior is noticeably crystalline, and this tendency has to be overcome in order to make it adaptable for the purpose. And the very remarkable observation was made that this tendency could be corrected by the addition of one-tenth of one per cent. of aluminum, in the form of stearate of alumina.

The Court: That was in 1889?

Mr. Dyer: That was in 1889. Having obtained the complete composition in 1889, it was then used by the Phonograph Works, and the record shows that ever since that date this identical material has been used to the extent of hundreds of thousands of pounds annually, the blanks being sold not only to the public generally, but to these very complainants themselves, the Columbia Phonograph Company; and Mr. Macdonald, the patentee in this suit, has been one of our customers ever since 1890, buying this material from us. Of course, since they have secured their patent they have made it themselves, but I mean they bought the material of us from 1889 up until the time they secured their patent.

Having produced the successful composition, Mr. Aylsworth, who is a very fertile man, did not rest there. He had made a successful thing, but he wanted to improve the process of making it and continued his experiments. The next effort was to produce stearate of alumina by a cheaper method than by the use of the expensive acetate. Mr. Aylsworth refers also to the fact that the acetate was objectionable because in the reaction acetic acid was formed, which had to be entirely evolved. He

wanted to make stearate of alumina from a cheaper salt, and the record shows he made it as a separate ingredient by precipitating alum, which is the very cheapest form of alumina. That experiment was known as No. 1029. Instead of forming stearate of alumina in the composition simultaneously with its saponification, as was done originally, he made it as a separate thing by a cheaper process and put in a certain amount. But it resulted in the same composition and there has been no change in the character of the composition. Having found that stearate of alumina could be made as a separate ingredient, it was no longer necessary to use caustic soda; he found he could use carbonate of soda to effect the saponification, and that was the second change. Later on he found he could use the crystals of carbonate of soda in their unground condition.

Up to that time the manufacture of this composition had been carried on continuously since previous to December, 1888, by the Edison Phonograph Works at Orange. It was desired, if possible, to keep this formula a secret, and therefore the Edison Manufacturing Company—Mr. Edison operating under the name of a corporation—commenced to manufacture this material at Silver Lake, New Jersey, and produced very large amounts there. It was manufactured under Aylsworth's direction until January, 1891, when Aylsworth left the Silver Lake plant and his place was taken by Mr. Miller, who testified as a witness.

Miller continued the operations at the Silver Lake plant until October, 1895. The material was molded into thick cakes, which were sent over to the laboratory at Orange, melted up and made into the blanks which were sold by the Edison Phonograph Works. That went on continuously; the record shows this composition was made to the extent of hundreds of thousands of pounds every year; that

these complainants were buying material all that time and making all their records on the composition that we were producing and selling to them.

Of course, your Honor will remember that during this work at Silver Lake, the later practice of Mr. Aylsworth was carried on, in which the stearate of alumina as a separate ingredient was used.

Mr. Mauro: I think the Court ought to know that the Columbia Phonograph Company was an entirely independent company and had no relation with the American Graphophone Company.

Mr. Dyer: There is no question, however, about its being the same company.

Mr. Mauro: But they were not at that time.

Mr. Dyer: The process carried on at Silver Lake used the stearate of alumina as a separate ingredient. Later on Mr. Aylsworth was called back to Silver Lake to look into some troubles they had encountered, and found that in manufacturing the stearate of alumina as a separate ingredient and keeping it around the factory for some time, it became damaged; dust and dirt got into it and those particles would contaminate the composition—and purity is absolutely essential. He made up his mind that the process ought to be improved and he went back to the original process of forming aluminate of soda and producing the stearate of alumina simultaneously with the saponification; but instead of using acetate of alumina, as he had done originally, which had the objection of requiring a long cooking, he made use of metallic aluminum. The metal itself was dissolved in caustic soda in minute quantity. The first form of metal used was the powdered form, which, as your Honor may know, is used for painting steam radiators so as to give them a silvery appearance; it is very expensive; and shortly after

that the aluminum in the scrap or sheet form was used. This is a specimen (exhibiting specimen to the Court). That was up to 1895. We have bills showing purchases of all these materials and showing the continuous purchase of all these ingredients from 1889 onwards. The record shows that the material was thus made by this metallic process, from October, 1885, by the Edison Manufacturing Company at Silver Lake, until June, 1896; in June, 1896, manufacturing was resumed at Orange by the Edison Phonograph Works. Since that date the process has been continuously carried on at Orange by the Edison Phonograph Works for the manufacture of this composition that was invented by Mr. Aylsworth in 1889 and that has *never* been improved upon, consisting of free stearic acid, stearate of soda, stearate of alumina and ceresin. The process used is that in which the metal is dissolved in a caustic soda, and this process is chemically identical with—or at least chemically equivalent to—the process originally used by Aylsworth in which the acetate of alumina was dissolved in caustic soda.

I don't know that these facts are questioned; I don't know that my friends question the fact that we have been making this material and that I have correctly stated the history of its development.

Mr. Massie: We admit that in 1889-90 they did that, and about that time they changed the process.

Mr. Dyer: So that what I have said is correct, and I need not take up the particular evidence showing we have done it. We have got the records and the evidence here. The actual records, the actual blanks that were made in those early days have been produced in this case and they show that the composition was exactly the same then as it is now; there is no change, no deterioration; it was the same then as it is now; these twenty-year-old records are exactly like those of to-day.

With the invention of the successful composition, which was a tremendous advance over anything that had been done before, the Edison Company was placed in a position of very great advantage, commercially. The Columbia Company, or the complainant, was still using these small paper tubes coated with a thin layer of ozokerite, which were very inferior to our metallic soap composition.

Mr. Dodge made an affidavit in November, 1894, which was filed in a suit pending in this court. That was before the actual invention of the Melzer composition, to which I will presently refer. And he gave the situation at that time. I will read from page 33 of the brief:

"Mr. Easton, who was made general manager of the company on or about the first of May, 1893, also recognized the fact that the soft cylinders were decidedly impracticable, because, very shortly after his assuming that position, he, to a great extent, caused these soft cylinders to be discarded, *employing in their places hard phonograph cylinders* purchased by him, I understood, from the Edison Phonograph Works, for the use of the Columbia Phonograph Company, of which said Easton was at that time president. At the present time (November, 1894), according to my information and belief, very few, if any, of the soft ozokerite wax cylinders are being placed upon the market by the Graphophone Company."

It would have been commercially impossible for the American Graphophone Company to have existed a year under that situation. The Edison Company had the perfect material and were selling it, and the Columbia Company was attempting to do business with the little paper tubes.

There were four courses open to the complainant under these circumstances, and I will show to your Honor that they have followed each one of them.

First, they had the option of purchasing Edison blanks.

Second, they had the option of inventing a new composition which would be as good as the Edison composition.

Third, they had the option of attempting honestly to reproduce the Edison composition.

Fourth, they had the option of dishonestly acquiring the secret of the Edison formula.

All four of these courses were adopted by them. The record shows that Macdonald and the Columbia Phonograph Company were purchasers of this composition from 1890 until, I think, 1894. The record shows the many attempts made by Macdonald to produce a composition for himself, and those attempts are referred to in this same affidavit of Mr. Dodge, which I regard as particularly valuable, since it was made contemporaneously with the facts therein stated.

Mr. Mauro: Of course it is not evidence, and we object to it.

Mr. Dyer: Not evidence, but it is part of the record. In Mr. Dodge's affidavit, describing these experiments of Macdonald, in attempting to produce independently a successful composition, he says:

"In addition to the objections which I have heretofore stated in connection with these two types of hard cylinders, it was found that shortly after being molded and turned down, a *bluish-white incrustation*, resembling mould, appeared upon the surface, and the longer the cylinders stood before being used, the greater became this mould or incrustation. This was found very objectionable by users, especially in connection with cylinders on which records were made which were designed to be permanent, for the mould would form in the record

grooves and in reproducing the record this conduced to confusion of the sounds and the production of scratching noises. This objection, too, was fully recognized by the Graphophone Company, and particularly by its manager, E. D. Easton. It was one of the causes which in May, 1894, induced the Graphophone Company to discontinue the manufacture of cylinders. Prior to this, however, every effort was made to avoid the difficulty. During the early experiments the Graphophone Company even went so far as to purchase from the United States Phonograph Company a quantity of fragments of phonograph cylinders of metallic soap (known as scrap wax) made by the Edison Company, and this was melted down at the Bridgeport factory and remoulded into new cylinders. It was found that the cylinders made from this Edison Company material did not have the objectionable feature of incrustation referred to.

The manufacture of cylinders, like the hard types referred to, was commenced some time in the fall of 1893, and continued to some extent up to the time I left the Graphophone Company in May, 1894."

The attempts made by Macdonald are referred to by him in connection with the development of the composition by Melzer—and I shall later consider some of his letters, written at the time, in which he gives the history of the work from his own point of view—and he was assisted by Dodge and Fargo, both of whom describe the difficulties they labored under. And the absolute impossibility—

The Court: Who was assisted by Dodge?

Mr. Dyer: Macdonald was assisted by Dodge and Fargo—the absolute impossibility of avoiding this difficulty; that they didn't make successful blanks; and in May, 1894, Dodge left, and the development of the composition was looked upon as absolutely hopeless, although Fargo, who was a mere laboring man and not a chemist, continued the same kind of

experiments Macdonald had been carrying on, until late in 1894, or possibly 1895. But Macdonald's work was a failure. On February 2, 1895, Macdonald tells what his experience had been and it is quite interesting. It is, in fact, very interesting as showing the absolute fallacy of the argument now advanced by the complainant in reference to the so-called "four corners" of the invention, and it shows there was no such thing.

Macdonald, writing in February, 1895, to Melzer, and of course this is probably as favorable as it could be—but it shows complete failure—says:

"When I first attempted to make a cylinder in 1893, I added some castile soap to stearic acid and then *hardened the mixture* by adding litharge or lead oxide."

He was not using a metal to *overcome crystallization*, but to harden the material, and I will show that a very large proportion of this lead oxide was used for that purpose. He continues:

"This gave me an idea, if nothing more. I next tried adding the lead directly to the stearic acid in a dry state, *uniting all that the stearic acid would take up.*"

He was not using a very small proportion of the metal; he was putting all he could in, to make it hard.

"This gave an exceedingly hard compound, but of little use for cylinder work. I then tried to saponify the mixture, but, as a rule, *succeeded only indifferently well.* I used water, and also added the caustic soda in a dry form. The greatest difficulty I experienced was the 'gummy' character of the blank, and next they were very noisy. Also it was very difficult to mold

them. As we had been making the paper ozokerite cylinder, and had the ozokerite handy, I tried tempering the blank with ozo. I went through quite a long series of experiments in this line *without much success*. After a long time I tried the acetate of lead. This gave much better results as to the texture of composition and records. I then had made a number of stearic acid soaps both by adding the soda dry and in water. After working with this for quite a while we thought we had a composition that was good enough, and started their manufacture. The result you know. *Sweating destroyed the record entirely.*"

That is Macdonald's own story written in February, 1898, long before this case came up. There is nothing there about the "four corners," concerning which my friends speak so earnestly, and there is absolutely no basis for that argument.

The Court: When did he commence his correspondence?

Mr. Dyer: September 1st, 1894.

It was a very interesting and a very sordid experience that Macdonald had with Melzer, but the time is short and I can only refer to it briefly, but I am sure your Honor must feel that it was an imposition on a thoroughly honest and thoroughly able man.

In the issue of the American Soap Journal and Perfume Gazette, of September, 1894, this advertisement appears:

"WANTED—Thoroughly practical man capable of carrying on experimental work in hard soap making. Work is on a metallic, insoluble soap, not used for washing purposes. One versed in the working of *stearine*, waxes and *lead soaps* greatly to be preferred. Address: T. H. Macdonald, Manager, Bridgeport, Conn."

Mr. Macdonald had, however, corresponded with Doctor Gathman, the editor of this paper, and told him of his difficulties, and Mr. Melzer saw Doctor Gathman before this advertisement appeared. Doctor Gathman told Melzer about this interesting question and Melzer corresponded with Macdonald to find out what it was, and on September 11, 1894, Macdonald wrote to Melzer—and this shows what Macdonald had done up to that time. He says:

"We are endeavoring to obtain a composition for the purpose of making records upon the graphophone that shall be an improvement on that we now use.

Our chief difficulty lies in a clouding or corrosion of the surface after it has been shaved ready for the record.

We have been using the composition noted in my letter to Mr. Gathman. That gives the best results we have yet obtained.

In case we should agree that you would undertake to work for us, of course we would furnish you with all the data in our possession regarding the mixture. Answering that portion of your letter, I would say that we do not use water at all."

That is the climax of his invention. He was telling the very best thing he could do. He was going over his entire history and telling what he had come to and the best composition he had made.

"We do not use water at all. We melt usually 320 pounds of 'AA' brand stearine, *not stearic acid.*"

Especially excepting stearic acid!

"When thoroughly melted we add about 50 pounds of black ozokerite. We then add slowly 40 pounds of acetate of lead and when thoroughly united add caustic soda in powder to the extent of about 32 pounds. The mixture is then cooled and molded."

Your Honor will see that is a completely different process from anything Mr. Massie has been contending for, the principle being that the stearate is melted before the hydrocarbon is added, then the metal is added and finally the caustic soda in a dry form is introduced. The record shows that stearine is absolutely useless, and that stearic acid in absolutely pure form must be used. What Macdonald had at that time was certainly not the "four corners" of an invention; I doubt very much if he had any stearate of soda at all. You will remember in Aylsworth's first experiment, when stearate of soda was first produced, it was precipitated by the addition of a metallic soap; and this would probably be the case with Macdonald's process; if there was any stearate of soda left unprecipitated by the enormous amount of lead used, it would be in very small proportions. But by using aluminum, as Mr. Aylsworth discovered, such minute quantities can be used that it does not precipitate a substantial amount of the stearate of soda. Macdonald didn't have the stearate of alumina; he didn't have the problem of crystallization to meet, but utilized a different process altogether and added such enormous proportions of metallic soap that a very large part, if not all, of the stearate of soda would be precipitated. So that instead of having a composition which was successful, he had one in which the proportion of free stearic acid is too small to make the material readily fusible. If it had any stearate of soda at all, it was a very small amount; and stearate of soda is the base, the fundamental and important element of this composition. Instead of having a minute proportion of stearate of alumina to correct crystallization, he had an enormous amount of stearate of lead, which was the main, the predominating material, and which was put in for the purpose of hardening the composition. He

did have ozokerite, which, however, had always been used in that work.

Melzer wrote to him on September 14, 1894:

"We will undertake the experiments for you and will charge you nothing if we fail; if, on the other hand, we should succeed in producing an article in every way suited to your wants and satisfactory, we will expect a remuneration corresponding to the value of our time and labor, and feel satisfied there will be no trouble in agreeing with you upon this question."

That is not, we submit, the offer of an employee, of a servant, but the offer of an independent inventor who took up the development of the problem Macdonald had failed to solve and after Macdonald had abandoned it.

That offer of Melzer's was accepted by Macdonald, although the proper pay that Melzer thought he was entitled to have, after he had achieved success, was not given to him.

In the letter of September 11th—

The Court: Well, even if a man be employed, if it is distinctly understood that his—if he be employed as an inventor, if it be distinctly understood that is the character of the employment, the invention will be the property of the employer.

Mr. Dyer: That is perfectly true, your Honor, but that would be practically a matter of contract and not of patent law. When we employ an inventor to take out a patent he gives it to his employer, and the employer does not pose as the inventor.

Mr. Church: It is a question of the right of property, not of the right of invention.

Mr. Dyer: That letter of September 11 is referred to on page 42 of my brief. It is a letter

from Macdonald to Melzer and recognition is made of the first contribution by Melzer in the statement:

"Possibly, *as you suggest*, Stearic Acid would be better than the ordinary commercial Stearine."

That was the first suggestion that Melzer made. In that same letter, which is a letter of September 11, 1894, Mr. Macdonald makes this very significant statement, which confirms what I have said as to the character of the invention made by him and showing the utter absurdity of the claim that he had this complete mixture and all that was necessary was to make a few changes. He says (top of page 43): "Our mixture is, in fact, *a saponified Stearate of Lead* with the addition of a little Ozokerite or Ceresin (which is refined Ozokerite)."

He recognized himself that his composition is *stearate of lead*. He added such an enormous amount of acetate or oxide of lead that all the stearate of soda was precipitated, and all he had left was stearate of lead, and that was the material he used to give the composition hardness, and not to correct any tendency of crystallization in the stearate of soda. In other words, it was exactly like the first experiments made by Mr. Aylsworth when he made stearate of lead and added ceresin or ozokerite and other materials to it.

The Court: Now this is what?

Mr. Dyer: Our composition is—

The Court: You use the stearate of alumina.

Mr. Dyer: Yes, and stearate of soda is the principal ingredient—55 per cent.; the stearate of alumina is used in very small quantities; then free stearic

acid is employed so as to dissolve the stearate of soda, and cerosin to temper it and make it non-hygroscopic. But that is not the thing that Macdonald had at all.

Melzer began to make the experiments, having concluded his arrangement with Macdonald, and immediately he began to improve and began to invent. He didn't follow Macdonald at all, *but started on a new track*, and the first thing he did was to use caustic soda lye, with which he was familiar as a soap maker. He dissolved in it the oxide of lead which Macdonald had failed with, and he reduced the amount of oxide of lead to less than one half that used by Macdonald in the very first experiment he (Melzer) made. He recognized that stearate of soda was a desirable thing, and stearate of lead an undesirable thing. Samples of this composition were sent to Macdonald and criticized as being too gummy, and Macdonald at that time pointed out the desirable features or properties of this material, which, of course, any one could tell by taking an Edison record and looking at it. There was nothing in the way of invention in that. The experiments of Melzer were very elaborate and continuous; he was working night and day, as he says, and Sundays; and on November 4, 1894, Melzer made a composition *in which aluminum was used in very minute proportions*. He wrote Macdonald on November 7th, saying:

"We have now thoroughly exhausted this subject, have experimented with almost every known metal, wax and gum, making up a barrel full of samples, and find only three metals are available for this purpose, and of these three, the one represented by samples of composition D and E sent you by Adams Express to-day, is, in our opinion, the best."

There was invention of a high order in that; that certainly was more than merely mechanical skill. He said that he had exhausted every metal, wax and gum, and by a process of elimination, he found the three possible things; one was lead, but not in the form that Macdonald had used, and that metal he said had a bare possibility of oxidation. The next metal was tin, which has never been used, as far as I know, at this time; and the other was aluminum, which was the desirable thing.

On November 17, Macdonald, after having received this sample, wrote Melzer as follows (page 44) :

"After using and carefully testing the cylinders made from the materials sent us by you, *we are satisfied that it is all right.* It molds readily, is easily shaved and prepared for the record, and the record has a good quality, being smooth and brilliant. In shaving down the rough mold we found it perhaps a little more brittle than former mixtures, but not enough so to cause any serious inconvenience. I would not be willing to sacrifice any of the good recording qualities for the sake of having it less brittle. * * * * If you are satisfied that the mixture will not effloresce or 'cloud' in any way, I think we are about ready to complete our work and take the mixture."

Complete *our* work! This is Macdonald who is speaking; this is the patentee, who now claims exclusive credit for everything!

"I think we are about to complete our work and take the mixture. Would it not be well for the writer to go to your factory *to thoroughly learn the process* of the proper mixing of the materials. We do not want to make any mistake in this particular, of course, and desire the very best results on the start."

Now, Melzer was a very conscientious old gentleman, and he worked day and night for the fun of the thing. He has his laboratory to this very day, full of these compositions, and he did not want to leave the thing as it was; if there was any trouble he wanted it corrected; so he suggested that he go on with the experiments, which was done; and these later experiments consisted simply in varying the proportions so as to get the desirable results. Having achieved success, the question of pay came up. How much was Melzer to get for this thing? He wrote and said that he had been working for a long time, 60 days, I think he said, and nights, and Sundays, and he thought that \$500 would be a fair price, because it would be a very valuable invention that he had made and he had spent a long time on it. But Macdonald wrote back, in the commercial spirit of the age, and asked Melzer if he could not give him a better figure and Melzer said that rather than take anything less, he didn't want any money at all, but to send him a graphophone and he would be satisfied; and the next day Macdonald sent him a graphophone, so that that offer could not be withdrawn. So these gentlemen have paid for this invention one graphophone, which Mr. Melzer still has and I really think he feels perfectly paid.

On December 26, 1894, Melzer wrote Macdonald:

"You can assure your Co. that, very soon after January 1st, *you will be in position to supply cylinders that will be eminently satisfactory in every respect.* We will send you to-morrow by Adams Express, the recipe with detailed instructions, notes, samples of the material, addresses and two or three samples of standard composition, and *if you will carefully follow our instructions, you will have no trouble making the composition,* and should any occur, nevertheless, then write to us or make us a visit and *see us about it.*"

It was not the next day they were sent, but two or three days afterwards, December 31, 1894, and Melzer wrote Macdonald as follows:

"We have sent you by Adams Express to-day a box containing samples of composition, materials used for same, and a few pieces of glassware, that you might not be able to obtain conveniently in your city. In one of the boxes of toilet soap you will find a little red book *containing recipe and full directions for making the composition*; also all other information that we believe you might need. *Follow our directions conscientiously and you will have no trouble, we think*; if, nevertheless, any difficulty should occur we are at your service. The other box we send you to-day contains a bottle of 37½ Caustic Soda Lye, enough for 50 pounds or more of the composition."

That little red book has never been produced. Complainants claim that it is lost.

Mr. Church: They don't deny they got it, however.

Mr. Dyer: No, they don't deny they got it; of course they got it.

Mr. Mauro: The testimony is that it is not in existence now.

Mr. Dyer: I direct your Honor's particular attention as showing they must have gotten the little red book—

Mr. Massie: That is admitted.

Mr. Dyer: Yes, I know—I direct your Honor's attention to the note appearing in the record at page 416.

This is from Melzer's original note book. He started out to make this composition with 50 oz. of stearic acid, 4 oz. of paraffine wax; 10¼ oz. 37° lye,

and dissolving in the same $\frac{7}{8}$ oz. of hydrate of aluminum. That is what he started out with. He cooked that for two hours, and then he made an observation and found it "slightly crystalline." He then added $\frac{1}{2}$ ounce of stearic acid and found it very crystalline. The notes continued:

"Dissolved and cooled down to 115° ; no change. Added $\frac{3}{8}$ ounce 37° lye; better; slightly crystalline. Dissolved, adding $\frac{1}{2}$ oz. of stearic acid."

The Court: Whose memorandum is that?

Mr. Dyer: Mr. Melzer's memorandum. Now, your Honor will find, when I show you the patent, that that identical formula is described in the patents, except that in his attempt to conceal it Macdonald has multiplied each of these figures by 8.

Macdonald, on January 3rd, acknowledged the receipt of the formula disclosed by him to Melzer. He says:

"I send you, at last, by Adams, a box containing a number of records on the various cylinders made from *your material*. Also duplicates on cylinders purchased from the Phonograph Co. In my opinion *your mixtures* with the possible exception of the first samples, are fully the equal of anything ever turned out by the Phonograph Company, and several samples I consider infinitely superior to them. There is, to me, a virility, a brilliancy, in the record that those on phono cylinders do not possess. I have been going carefully over your directions for the mixture, and will, to-morrow, *make my first essay at a mixture.*"

Some correspondence took place between these two gentlemen after that, from which it appears, as your Honor will see, that Macdonald was the worst kind of an ignoramus, that he knew nothing about this art, and was being taught by Melzer how to

make this composition which he now claims to have invented.

On January 8th, 1895 (brief, page 51), Macdonald wrote:

"I am not having quite as good success as you did. Of course this could hardly be expected."

He also says in the same letter:

"I feel, however, that I am on the right track and that *I will soon acquire the cunning that will produce a good cylinder.*"

That is the letter of a man who claims that he made this invention, and all that Melzer did was to add this small quantity of alumina to correct crystallization. "I will soon acquire the cunning that will produce a good cylinder."

Macdonald did not acquire the cunning to make the composition at all, and in February, 1895, had to go to Evansville to learn how to make the composition, which he now claims as his own invention. He spent two weeks there and came back to Bridgeport, and the letters in the record written during the summer of 1895 show that Macdonald was having difficulty in making the composition, and those letters also show the suspicion that was rankling in Macdonald's mind throughout that whole time, that perhaps, after all, Melzer had not succeeded in re-inventing or reproducing the Edison composition, but had made something that was not quite so good. That was a suspicion that breathes all through that correspondence. So that in June, 1895, poor Mr. Melzer, the man who had taken a graphophone for his work, came all the way to Bridgeport to help him out of his difficulties.

The Court: Where is that referred to in the brief that Macdonald went to Evansville?

Mr. Dyer: It is on page 51, where it says that some time after this, Macdonald, apparently believing that he could not be properly instructed by correspondence, determined to visit Evansville, and, according to Melzer, he arrived there on February 9, 1895, and stayed until February 19 (page 382, folio 1382).

Melzer went on to Bridgeport, and spent a couple of weeks there trying to teach Macdonald and Fargo how to make this composition.

The Court: Where is that referred to?

Mr. Dyer: On page 52 of the brief.

He found, your Honor, that Macdonald was pouring this composition into the molds by means of a coffee pot that had a spout up at the top and there was more or less bubbling on the surface of the composition in the pot, so that these bubbles and this foam worked into the composition in the molds, and appeared as pin holes in the product, and Melzer suggested that he should pour it out of a teapot, so that the composition would be brought out of the bottom. This would prevent the foam and bubbles from getting into the mold, and Melzer told him if he would do so he would have no more difficulty.

Mr. Church: I don't know if your Honor quite understands that—Melzer suggested pouring it from a spout which came from the bottom of the vessel.

The Court: Yes, I understand.

Mr. Dyer: So that in September, 1895, Macdonald wrote to Melzer that the pin holes seemed to have disappeared.

Here was this wonderful inventor, who did not have sense enough to know that the pin holes were caused by bubbles flowing in from the top of the pouring utensil.

Does that present the case of an employer and employe? Did Macdonald have a complete structure and merely go to Melzer and get chemical knowledge? Clearly not. The "structure" Macdonald had was a completely different structure from that which Melzer produced. It was a structure embodying "four corners," according to the theory these gentlemen have evolved, and it was a composition which Macdonald, according to his own statement, saponified with stearate of lead. The stearate of soda was inconsequential, and the stearic acid was a very small amount and made up a completely different process. Melzer's work was on different lines, not only as to the composition but as to the difference in conception. He had an absolutely different process, and he never made this composition by the process of Macdonald. Macdonald, describing his process to Melzer at a time when he evidently regarded it in its most perfect form, showed that it was carried out quite differently from the process conceived by Melzer. The most successful thing Macdonald had at that time was the thing which he disclosed to Melzer. All his former experiments had been abandoned, and what he disclosed to Melzer was an entirely different thing from what was disclosed *by* Melzer.

So that Melzer independently, honestly reproduced the Edison composition, the only difference being that he used the oxide of alumina whereas in the Edison composition the acetate was first used and afterwards aluminum in a metallic form. But in both cases the result was the same, there being a marked proportion of stearate of alumina remain-

ing in the composition to correct the crystalline disposition of the stearate of soda. So Melzer independently reproduced the process produced by the Edison Company—not the process used by the Edison Company at the time he made it, but he reproduced the Edison process as used in 1889, with the acetate of alumina, and which we subsequently used in October, 1895, with the metal aluminum.

Not only did Melzer make these suggestions, which are of great importance—

The Court: I understood, and I want to verify my impression, if it is a correct one, that if you multiply these elements by 8, you get the combination of the patent exactly.

Mr. Dyer: Exactly—formula A; exactly, with this exception, that in the patent Macdonald refers to, 37½% lye, and in the note book it refers to 37° lye. But in the letter which Melzer wrote Macdonald, describing the thing, he mentions 37½%.

The most that can be said for Macdonald is that he suggested to Melzer the use of metallic soap, but he suggested the wrong metallic soap. He suggested the stearate of lead, which everybody admits was not useful at all; he did not suggest stearate of soda, which is the basis of metallic soap. But that is all he did. He said, in effect, to Mr. Melzer: "I think the record should be made with metallic soap. With that suggestion, kindly go ahead and carry out my idea, develop this composition, and after you have done so, I will claim it as the inventor."

Having suggested to Melzer that the blanks must be made of metallic soap, Melzer goes ahead and finds that stearate of soda is the right kind of metallic soap and ought to be accompanied by an equal amount of stearic acid. Macdonald having

suggested only that metallic soap was the proper material, now claims as his own, the development of the whole matter.

The record shows that everyone in the art knew that the Edison composition was some sort of metallic soap. Mr. Dodge, in his affidavit, made in November, 1894, and only a few months after Melzer was taken into this matter, says it was a metallic soap. He does not refer to it as a secret at all,—everyone knew it was a metallic soap. He said: "The general understanding was that the Edison composition was a lead soap," and that is why Macdonald was so diligently limiting himself to lead soap. Your Honor will find all through these note books that they refer to lead of various kinds throughout—oxide of lead or acetate of lead or sugar of lead. He never got away from that idea of lead because he knew the Edison composition was made out of lead, and that was the thing that was going to spell success, as he thought, and if he could only hit on the right proportions, he could reproduce the Edison composition. That is why he stuck to lead.

Now I get to the next step, the dishonest attempts to acquire the Edison formulæ, some of which were prior and some subsequent to Melzer's attempts. Macdonald never seemed to have gotten over the idea that, although Melzer made something pretty good, it was not exactly what the Edison people had, and it was the Edison composition that he wanted.

Emerson, who is connected with the complainants at the present time, but was not at the time he made this affidavit, made an affidavit in November, 1894, referred to on page 56 of my brief, in which he says: "In July, 1894"—now, July, 1894, was two months after Dodge left when Macdonald had

been able to accomplish nothing, and was months before he went to Melzer, and Mr. Emerson says:

"In July, 1894, I was approached by Mr. R. F. Cromelin, an officer of the Columbia Phonograph Company, and as active associate with Mr. Easton in the exploitation of the graphophone, who, assuming that I knew the composition and method of manufacture of the Edison Phonograph blanks, *asked me to disclose the same*, and suggested that if I should go to Washington and give Mr. Easton the information I would be paid liberally. This episode resulted in a correspondence between Mr. Easton and myself early in August, 1894, in which Mr. Easton urged me to give him the information, and I refused to have anything to say on the subject."

That affidavit was made in November, 1894, two months after Melzer was given the problem to develop.

English testified (page 57 of brief), as follows:

"Q. 70. Did Mr. Macdonald ever tell you that he had tried in numerous ways to acquire the Edison formula?

A. He did.

Q. 71. Do you recall what he said on this point?

A. There were remarks made on the subject, but I do not remember whether it was Mr. Macdonald or his assistant who made them?

Q. Who was his assistant?

A. If I remember rightly it was Mr. Dodge.

Q. Do you recall what Mr. Macdonald or Mr. Dodge said?

A. That efforts had been made to secure the formula through secret agents at the Phonograph Works."

The record also shows that in order to acquire the Edison formula, one of the Edison blanks was

sent by Macdonald to Melzer, who analyzed it, and the analysis was sent to Macdonald. On April 12, 1895, he wrote Melzer, as follows:

"I have turned to your analysis of the S. L. (Silver Lake) cylinder many times with a deal of interest many times. *Do you think it would be possible to make this mixture and get the precise result there shown.*"

Macdonald had an amusing experience with a man named English, along this line. English had been the former purchasing agent of the Edison Phonograph Works. He bought all of its materials, and was purchasing agent in 1889 when we used acetate of alumina, and he says that he knew we used stearic acid, etc., for the composition. He left in 1889 or 1890 before we began to use the aluminum process, but he was there during the time of the use of the acetate of aluminum process; he knew what materials were then used. In 1893-4 he entered into correspondence with Macdonald. Macdonald knew he had been with us, and English told Macdonald he had a composition which he thought Macdonald could use,—and in November, 1894, he sold Macdonald some formulae using ingredients which included acetate of aluminum. We do not know the proportions of these formulae, but Mr. Macdonald admits that there was a formula sold him, and in it the same ingredients were used that English had purchased for the Edison Phonograph Works as his agent, and by the irony of fate, Mr. English, who disclosed to Macdonald an unsuccessful composition, was paid five hundred dollars, while poor Melzer, who reached success, took a graphophone!

The reason the English composition was unsuccessful was because it contained acetic acid. Macdonald says, referring to the English formula (brief, page 58):

"I did try this formula with very good results. The mixture appeared to be of a very close grain and just about what we would like to have for a cylinder material, but upon letting it stand for any length of time, especially in a hot, moist atmosphere, the surface would become very badly clouded; in fact, in a great many cases, worse than the formula which we were using, which contained the oxide of lead. It was, therefore, of very little use to us, and we never have used this formula in any way, except experimentally."

Macdonald admits he got that thing from English. That was the first disclosure he ever had of alumina, the first idea he ever had of the possibility of using something else than lead. That was in November, 1894. On February 2nd, 1895, Macdonald wrote Melzer a letter which was intended to make clear that Macdonald had made this invention himself. He says (brief, page 59), writing poor Melzer, who had given him this successful composition:

"I then began to try the other acetates and about the middle of November last *happened on* acetate of alumina."

I suppose that by "happened on" he means that English gave it to him, although that is not the usual meaning of the term.

"—happened on acetate of alumina, which, with the exception of your composition, gave me the best results of anything I had yet tried. This was the 'sour smelling' cylinder of which you spoke. The way has been long, also at times very weary. My training had not been in this line and I was, therefore, handicapped in the struggle. Well, I think it is past now, *thanks to you,—*"

That is, Melzer.

"—and hope that *we* will all enjoy the fruits of the successful blank."

It hurt Melzer's feelings to have Macdonald use acetate of aluminum, for Melzer wrote back that he would no doubt meet with trouble, but Macdonald, on March 29, 1895, after he had submitted samples of the acetate of alumina composition to Melzer, says (brief, page 60) :

"I have been assured on no less authority *than the former manager of the Edison Phonograph Factory* that the Silver Lake people used the *Acetate of Alumina*, and that they do not use water. Do you think this possible? It is a serious matter to me to have a failure now, and anything that will promise success is hopeful."

Melzer, on April 1, 1895, says:

"It may be that the Silver Lake people *have at some time used acetate of aluminum*; there is surely none in the composition we analyzed."

On April 8, Macdonald wrote back:

"I have it from no less authority than the former purchasing agent of the Silver Lake people that they use acetate of alumina. *He told me positively that he had purchased it for them by the barrel for over two years.*"

And Macdonald, on April 12th, was still loyal to the English formula, because he wrote Melzer:

"I have made up a large number of cylinders by the dry process, using acetate alumina and I must confess that the results are splendid. I sent fifty of them to Washington and Mr. Child pronounced them equal to anything yet received."

On May 26, 1895, Macdonald says:

"Since writing to you before this I have come to the conclusion that the so-called dry mixture that is made with acetate of alumina, is of no use. It is beginning to sweat. That is enough. We don't want to touch it again with a 40-foot pole. It has acted just as you said it would."

That was Macdonald's own attempt to carry out the process using acetate of alumina which was disclosed to him by English, who obtained it from the Edison Phonograph Works, of which he had formerly been purchasing agent. Macdonald did not know that by starting off with acetic acid the difficulty would be avoided.

Now we come to the last dishonest attempt, which was quite a success.

The Court: We will stop here now, if this is a good place.

(A recess was then taken.)

Mr. Dyer (resuming): Before taking up the next point I desire to show your Honor some of the exhibits. Here (showing exhibit to the Court) for example, is the original record that was used before the development of the present composition. Here (presenting another exhibit to the Court) is the first record that I have been able to find, and it appears to have been made in December, 1888, and was the forerunner of the others. That (showing the Court another exhibit) is the modern composition.

When he began to put oleic acid in he found in the summer of 1889—

Mr. Mauro: Who, Aylsworth?

Mr. Dyer: Aylsworth—he found it produced that effect (indicating on exhibit) and they had to be recalled. Mr. Aylsworth, who had been in Europe in the fall of 1889, refers to the fact that the records first used by him had that same defect, but later, in the fall of 1889, they began to be all right again; that is to say, the oleic acid had been left out, and the ceresin used. Here (indicating) is one that has been in possession of one of the witnesses for a very long time; it was made on January 1, 1893, as appears by the announcement on the record, and the witness states that record contained the voices of his children and people who were at the house on that day. This (indicating) is the modern composition, which is the same exactly which we have used now continuously for twenty years.

Mr. Mauro: But made by a different process.

Mr. Dyer: Made by a different process, as I explained before.

When we adjourned for the recess I was about to consider the last dishonest attempt made by the complainant to acquire the secret of the Edison composition.

An employee of the Edison Phonograph Works named Storms, when the manufacture of the composition was once again resumed at Orange by the Edison Phonograph Works, was, in June or July, 1896, in charge of one of the rooms in which the composition was manufactured, and he states that his duties carried him through the wax room every day, and in passing through the wax room he had occasion to observe the process that was being used in manufacturing that composition under a man named Aschenger. In six weeks he was able to tell how the process was carried out, the temperature used, and what the ingredients were, but he did not

know what the proportions were. Those proportions were given to him by Higgins, who had been connected with the manufacture of the wax composition when it was being made at Silver Lake by the Edison Manufacturing Company. Higgins gave this formula to Storms. Higgins does not admit that he did give the formula to Storms, but he does not deny that he did so, and he states that in Storms' different talks with him he seemed to be very curious about the formula. Storms is a man who could not have produced it independently; he must have acquired it in some way, and it was reasonable to suppose he acquired it from Higgins. In August, 1896, Storms wrote to a man named Von der Lippe, whom he had formerly known at the Edison Phonograph Works, and who was then employed at the American Graphophone Company's factory at Bridgeport, and asked Von der Lippe to see if he could not give him a job. Von der Lippe went to Macdonald and told him that Storms had been employed in the mixing room of the Edison Company and wanted a job, and Macdonald asked him if he knew anything about wax, and asked Von der Lippe to send Storms up. Storms told Macdonald he knew the entire secret of the Edison formula and would carry it out for Macdonald so that the Graphophone Company could have the same thing and the very thing that Macdonald had so long looked for—the identical formula used by the Edison Company. Macdonald asked him what material was used and Storms told him to get stearic acid, which they already had, carbonate of soda, which they did not have, and ceresin, which is something I don't think they used. They used paraffine and a little powdered aluminum. That was in August, 1896. Powdered aluminum was the particular form of aluminum that the Edison Manufacturing Company was us-

ing at Silver Lake, but later when the work was resumed at Orange the Edison Phonograph Works was using the aluminum in the acetate form, but Higgins did not know that, because he had left them when they were at Silver Lake, and told Storms only of the powdered aluminum. Macdonald ordered these materials from the very people that we got them from, and Storms entered the employ of the Graphophone Company the day after Labor Day, 1896, which was the first Tuesday of September, 1896, and he began at that time to practice the Edison process as he had learned it at Orange, and gave to the complainant the Edison formula, using metallic aluminum. These facts are not denied by Macdonald at all. Macdonald had not written to his old friend Melzer for a long time, but when he thought he had discovered, in this way, what the Edison formula was, he could not resist the temptation of writing again, and on September 3, 1896, possibly before Storms actually entered their employ, and a few days after he first saw Macdonald, Macdonald writes to Melzer as follows (brief, page 65) :

"I recently learned an interesting thing in connection with the Phonograph cylinder. A party who pretends to know states that it is made of Stearic Acid, Caustic Soda, Sal Soda, 'Aluminum Bronze Powder' and water. The alleged process is to dissolve the 'Aluminum Bronze' in a solution of Caustic and Sal Soda, and then unite this with the Stearic Acid as usual. They use white Ozokerite for softening the mixture."

That is the same as ceresin.

The Court: You say ozokerite was ceresin?

Mr. Dyer: Ozokerite is a crude form of ceresin; ceresin is refined ozokerite.

"I have found that 'Aluminum Bronze Powder' is pure Aluminum ground to an almost impalpable powder. I wrote to New York and obtained a sample of it. I enclose a little of it in an envelope. I did not learn anything in regard to the proportions to be used. What do you think of it?"

Melzer wrote back and said he thought it was the height of folly to use alumina in the forms of bronze powder, and suggested to Macdonald a method of using the alumina.

This is formula B of the patent, you will remember. We have already considered formula A.

On September 21st, 1896, Macdonald wrote to Melzer as follows:

"Now in regard to the formula I mentioned as coming from the Edison people, I am afraid you will have to modify your good opinion of Thomas, as there is little doubt that their formula is practically what I told you. In fact, the man who gave me the information came to the factory, and with the materials which I bought from him made up some 400 cylinders, and they are all right. I am to have a number of records made on them and I will send you a dozen to-morrow. He has not given me the exact formula, *but as I saw him make it*, I think it was very nearly as follows:

100 lbs. Stearic Acid.

23 lbs. Sal Soda.

1 lb. Caustic Soda.

Dissolved in about 5 gallons of water and then add, at boiling point, 6½ ounces of Aluminum Bronze Powder."

That is not identically formula B of the patent, but Mr. Melzer calls attention to the fact that by multiplying those figures by 3 substantially the formula of the patent is obtained, the variations are hardly noticeable.

The Court: You have by that substantially formula B of the patent, by multiplying by 3.

Mr. Dyer: Yes, formula B of the patent.

Melzer still did not believe that alumina bronze powder was the proper form and on October 6th Macdonald wrote Melzer as follows:

"I sent you by Adams Express yesterday six records on the cylinder which we have had under discussion. They are certainly good, and they are made in exactly the way I have stated to you. *They have so made them at Edison's place*, and if your idol stood on a more scientific foundation than this, to earth he must come at last! The young man who made these, and they are out of a batch of 300 lbs., *made them in my presence*. I did not ask him for the exact weight of his ingredients, *but they were about as I have written you*. The mixture takes about the time ours takes."

And on October 17th, and both of these are on page 67 of the brief, Macdonald again wrote Melzer and said:

"The young man of whom I spoke in my former letter assures me that every cylinder made at the Edison Works during the last four years has been made with Aluminum Bronze Powder."

He was wrong in that respect. It had been used for only about a year, in that form.

"He has made us a quantity of them exactly, so he says, as they are made there, and to tell the truth they are good cylinders, and resemble the phonograph product so closely that I cannot tell the difference, so *down* comes that idol!"

And the last letter that Macdonald wrote on this subject was in June, 1897, after the application for the patent was filed, and in that letter he says:

"We have been making a large number of cylinders *on the Edison method*, that is, using the metal Aluminum and Sal Soda in the solution. We are now making up some special cylinders for Mr. Emerson's use, but not that way. They are being made *on your formula*."

That is the experience these people had with Storms. I will briefly refer to one small fact, your Honor, as showing the peculiar dishonesty of their operation—dishonesty going so far as to actually mislead their own counsel. Mr. Storms, who testified, told this story—he was a drunkard, an unfortunate man in the lower strata of humanity, but he told a true story, and he was cross examined by Mr. Mauro obviously for the purpose of breaking down his story. I know Mr. Mauro would not have questioned the man's testimony at all, if he had been convinced he was telling the truth. Now what do we find? Here was this poor drunkard being examined for the purpose of being tripped up, and what do we find? On page 203 of the record, at x-Q 110, he is asked:

"Did you ever claim to Mr. Macdonald that the formula you described to him was the Edison formula? A. I did."

Mr. Mauro was informed, as he says, that Storms had not told Macdonald it was the Edison formula, and Macdonald's own letters to Melzer written at that time are full of statements concerning Storms and Macdonald admits that those letters referred to Storms.

Now, if the Court please, it seems to me that with the story I have told in mind, anyone knowing that that story would be told in a court of justice would presume that in some way there was an attempt being made here to secure some redress for

Mr. Melzer, possibly, perhaps to get him further compensation for his work, or to enjoin these people from practicing the process that they had dishonestly acquired from one of our employees. But the situation is that we are here defending a suit on a patent, that they applied for in November, 1896, describing Melzer's formula and Storms' formula, which suit was not brought against us until 1905, almost twenty years after the events on which we had to rely for prior use had taken place, undoubtedly with the idea that the evidence of those events could not be produced. But we have fortunately been able to present to your Honor the record of the bills and of the correspondence between Macdonald and Melzer, and if your Honor please, the story that I have told—and I can assure you that it is supported absolutely by every deposition in this record—shows that the Court has been imposed upon, and, in bringing a suit of this kind, in proceeding with the testimony after our answer was filed fully setting up all these defences, in compelling us to go throughout the country for the purpose of taking these depositions so that our defence might be proved, and, after the defense had been completed, in taking rebuttal testimony, which simply added to the iniquity, as I will show your Honor; in setting the case down for trial and requiring us to prepare briefs—that all these proceedings are iniquitous and outrageous, and I think the complainants in this case are guilty of a clear contempt of court in taking up the time of your Honor with a suit so absolutely lacking in any equity as this one is.

But it is sufficient to say that when we come to the patent we come to a document full of broad misrepresentations and misstatements from the first page to the last.

This patent was taken out dishonestly, the description was purposely misleading, the Examiner was imposed upon, the Patent Office was imposed upon, and their own expert was imposed upon. There was no such thing as the "four corners" of the invention. That was a theory developed after the patent was granted. But Macdonald poses as the inventor of the first successful sound record material, and what he is seeking to impress upon the public and on the Patent Office is that every sound record material made before his invention was unsuccessful and that he was the man who made this complete composition, who made the Melzer formula and the Storms formula, and discovered the availability of aluminum in small proportions to correct the crystalline tendency of stearate of soda.

See how misleading this is when we remember that for years—for seven years—before this application was filed these complainants and their predecessors had been buying this stuff from us and were our customers.

Turning to the patent we find at line 36 the following:

"It has been heretofore proposed to use as a sound recording material an insoluble soap, made by saponification of any fatty acid by means of an earthy alkali, such as lime. It has also been proposed to employ a metal, such as lead, combined with stearic or oleic acid, and particularly a mixture of oleate and stearate of lead; but tablets made of insoluble lime soap, or of stearates or oleates of lead have never yielded commercially successful results."

When Macdonald was making this statement he knew all about the Edison Company's, works Storms had been with him and he had written Mel-

zer that for four years prior to this time the Edison Company had been using metallic soap. He knew about the previous use of alumina and knew that he was not making a true statement. He did not tell the Patent Office the truth, that alumina soap had been used and a recording composition had been made that corresponded exactly with the thing he was trying to cover himself. He put forth a false statement of the situation in order to mislead the Patent Office. Then he goes on and says:

"Several practical difficulties have been encountered in endeavoring to make tablets composed wholly or in part of soap. The chief difficulty has been that the surfaces of such material become coated after a greater or less length of time with a bluish film, having the appearance of mold and which has been termed 'efflorescence.' This is due to the presence in the material of hygroscopic compounds, which on being attacked by moisture work out to and spread upon the surface of the tablet."

What was it intended the Patent Office should think about that? Why, clearly, that everything prior to this invention would effloresce and a bluish mold appear and that this man had made an invention to overcome that. Yet prior to that time, for years, he had been buying a perfect composition from our company and knew that the Edison people successfully overcame that difficulty, and he was perfectly familiar with the fact that it was only in his own unsuccessful experiments in which the bluish mold had been encountered, and a true statement to the Patent Office would have prevented him from getting the patent with which he expected to impose upon the public.

Then he says:

"Another difficulty that arises is the formation of crystalline or crystallizable compounds in the operation of making soap. The object of introducing a metal (or metallic salt) is to prevent all tendency to crystallization, it being of the first importance to secure a composition which shall be, and under all conditions remain, perfectly amorphous and presenting equal resistance to cutting in every direction. All ordinary commercial soaps have this tendency to crystallization in some degree, it not being possible to introduce sufficient sodium or soda salt to prevent all crystallization."

That was something that had been corrected in 1888 by Mr. Aylsworth and was corrected in all the compositions Macdonald was getting from us and was using. Then he says:

"In carrying out my invention whereby all the conditions herein pointed out as essential are secured, I take stearic acid as nearly pure as can be obtained, and convert it into soda soap in the manner hereinafter explained. The composition, however, differs from ordinary soap in that it contains no oleates, I having found that the presence of even a small quantity of oleate or oleic acid is detrimental."

"I having found." I will call your Honor's attention to that. He did not find it at all for he was told that by Melzer. On September 9, 1896, Melzer wrote Macdonald a letter which is referred to in my brief on page 72, in which he says:

"While on this subject I wish to caution you against using a soft paraffine or a soft i. e. oily stearic acid, or against using any oil, mineral or animal, for softening your cylinders; it will be sure to sweat out in warm weather; I have had several such cases happen to myself, and *can trace them all to the use of oleic acid*, soft paraffine wax, cylinder oil, adamantine stock, etc.

That was pointed out by Melzer and was not an observation of Macdonald's.

Now turning to page 2 of the patent we see that after referring to the soap, Macdonald says (p. 2, l. 17) :

"In this soap I have incorporated Aluminum which I have found to be the metal best suited in all respects to the purpose."

"Which I have found to be the metal best suited." That statement was made by Macdonald two years after the use of aluminum was suggested by English, almost two years after it was suggested by Melzer and two years after the metallic form had been suggested by Storms and yet he says: "I have found."

That was, in my opinion, a deliberate misstatement, and when Macdonald made oath that he was the first inventor of the composition and process described in the patent I think he made a deliberately false oath.

Then the patent refers to the method of introducing the metal and he says (p. 2, l. 20) :

"This may be used in the form of Aluminic hydrate or in the metallic state, powdered or in small ingots."

I was bothered for a little while trying to think where in the world Macdonald got the suggestion of small ingots. Of course I knew he could not think of that himself, and I found that in his letter to Melzer of October 6, referred to on page 74 of the brief, Macdonald says:

"I made up a batch of cylinders to-day with scrap aluminum, as you directed in your last."

So that this suggestion, you see, was not Macdonald's.

The Court: Is that equivalent to ingots?

Mr. Dyer: Yes, sir.

Then the patent says (p. 2, l. 23) :

"The method of introducing the metal is, moreover, important, owing to the tendency of sodium and aluminum when combined to form crystallizable compounds. Preferably the metal is first added to the soda-lye, forming with a portion thereof aluminate of soda (sodium-ortho-aluminate)."

Now, we know that was no invention of Macdonald's. That was the process which was independently worked out by Melzer.

The Court: What is that?

Mr. Dyer: Where Macdonald says in his patent:

"The method of introducing the metal is moreover important, owing to the tendency of sodium and aluminum when combined to form crystallizable compounds. Preferably the metal is first added to the soda-lye."

The Court: Oh, yes.

Mr. Dyer: That was a method which Macdonald didn't invent at all; it was invented independently by Melzer and was carried out by the Edison Company in October, 1895, at Silver Lake and was carried out by the Edison Company in 1889 when the acetate of aluminum process was used.

That disposes of every point in the patent, no matter how small it may be, up to the two formulas. Then we have formula A which is identical with Melzer's formula and formula B which is practically identical with Storms'.

That disposes of the patent.

The Macdonald patent is a patent which a man has obtained from the government and which does not contain a single statement of invention or a suggestion that he can honestly claim was originated by himself.

The complainant has evolved this theory of the "four corners" of the invention. I do not think that amounts to anything. In fact the theory was invented to support the patent and I think there is a good deal more ingenuity in the theory than there is in the patent. It is sufficient to say that the material Macdonald had and which he disclosed to the world did not embody the "four corners" at all. Macdonald did not write to Melzer and say "I have made a composition embodying the four corners; now I want you to take this as a foundation or framework and simply use your chemical knowledge in making it all right." But he sent Melzer a complete thing, an entity saying "This is my composition and I make it the following way," and Melzer took that, found it useless and evolved a completely new structure made by a completely new process.

What was the purpose of the patent? That is shown very clearly by considering the original claim.

The Court: Macdonald says in his first letter to Melzer and I think that is an important point, "We are endeavoring to obtain a composition for the purpose of making records." That is the very first opening sentence. "Our chief difficulty" and so on. He does not even say he has succeeded.

Mr. Dyer: No, he doesn't, and the record shows he had given it up. I have not read to your Honor all of the letters, but the correspondence between

Melzer and Macdonald is very interesting. It shows a very intelligent man out in Evansville who thoroughly understands the subject, and who is patiently trying to explain how to make the Edison formula, writing to Macdonald, a chemical ignoramus at Bridgeport who didn't know the first thing about these compositions.

Here is this man Macdonald, having obtained the work of Melzer and having stolen our formula two months after Storms went up to his factory, making an application for the patent with these claims. But I do not care anything about the claims now; I am showing this is a fraudulent patent; that it is based on fraud and that it makes no difference whether we infringe the claims or not, for it has no standing in this Court of Equity.

They cannot come in here with a patent based on fraud and taken out under the infamous conditions of this patent, and ask the Court to give them relief.

But these are the claims:

"11. A composition of matter for a sound recording tablet, composed of stearic acid, caustic soda and aluminum, substantially as described.

12. A composition of matter for a sound recording tablet composed of partially saponified stearic acid and aluminum, substantially as described.

13. A sound recording tablet composed of partially saponified stearic acid, aluminum, and a softening material, substantially as described.

14. A sound recording tablet composed of soda soap having aluminum incorporated therewith."

Is there any doubt, your Honor, that this man was attempting to obtain by these claims, a patent

which would cover the Edison composition that he said in his letters to Melzer had been used for four years and that he had been purchasing and his company had been purchasing since 1890.

The Court: They were disallowed, were they not?

Mr. Dyer: They were disallowed.

The Court: Disallowed why?

Mr. Dyer: Some references were cited but it is sometime since I consulted the file wrapper and I do not now clearly recall what they were. But there was another claim in the case, the tenth claim of the patent, which is almost as broad. It reads as follows:

"A composition of matter for a sound recording tablet formed of pure stearic acid (free from oleic acid and glycerine)."

Those are the suggested *improvements* made.

"partly saponified by caustic soda and having aluminum incorporated therein, substantially as described."

We were originally sued on that claim, but the claim was withdrawn and they thereby admitted that as far as the product was concerned they had no chance against us. Their contention now is based on the process entirely and they attempt in this argument to sustain that on the ground that our process was carried on secretly and we should not be allowed to rely upon our secret process.

It is unnecessary for me to take the time of the Court to consider this proposition of the "four corners." There were no four corners disclosed by Melzer, and the composition disclosed to Melzer was an entirely different composition. It was a

stearate of lead composition and Macdonald himself admits it was a stearate of lead composition.

I would like to call your Honor's attention to one more feature of this case, showing the extent to which these people will go, even to the point of embarrassing their own counsel. I shall refer to it briefly. Mr. Fargo had been Melzer's assistant and his note books were introduced and in the note book the abbreviation "A I" appears.

The Court: Fargo?

Mr. Dyer: Yes, sir, the assistant of Macdonald, who succeeded Dodge. He is not a chemist but he used the letters "A I" in his note book. I asked him what they meant and he said they meant alum, and afterwards, on thinking it over he said "I think 'A I' means acetate of lead." The next morning he appeared for further examination and he said "Upon thinking the matter over I am convinced that "A I" means acetate of lead because all the experiments in the note book, or most of them make use of that expression, and I know that I did use acetate of lead and that my alum experiments were disconnected and there were only a few of them, so I am sure that "A I" means acetate of lead."

The Court: That is Macdonald's note book although made by Fargo?

Mr. Dyer: No, it is one of Fargo's. He had taken it away. Then Macdonald introduced note books in rebuttal and in Macdonald's note books there were notes by both Fargo and Macdonald in which the abbreviation "A I" was used. Mr. Macdonald was examined and at one session stipulated testimony of his was taken in my absence, to which I agreed, of course, and in that stipulated testimony, Mr. Macdonald was made to say by his counsel that certain—Have you that note book?

Mr. Mauro: There it is (indicating a note book among the exhibits).

Mr. Dyer: (Referring to the indicated note book). That certain symbols in his note book indicate various chemicals. "S I" seems to have been sugar of lead and "A I" acetate of lead, although one might think it was alumina, and on page 30 of the note book (exhibiting same to the Court) in rather recent handwriting, it says that "A I" equals acetate of alumina and Macdonald in his stipulated testimony was made to say that "A I" meant acetate of alumina. Although it does not appear on the record—

The Court: Will you let me see that note book?

Mr. Dyer: (Handing note book to the Court)—although it does not appear on the record, I remonstrated with Mr. Massie and said that was a mistake which ought to be corrected, that I knew "A I" did not mean acetate of alumina, but meant acetate of lead because Mr. Fargo had said so and I believed Mr. Fargo. But Mr. Massie did not correct it and that statement remains in the record today, the stipulated statement of Macdonald being that in that notebook "A I" means acetate of alumina. Following that was the testimony of a man named Manwaring. Manwaring attempts to explain these note books. The man who made them was not examined as to what they meant and this "expert" was called upon to explain these note books on the assumption that "A I" meant acetate of alumina, and Manwaring's conclusions are that Macdonald (brief, p. 88) from time to time changed the proportion of his ingredients and changed the form of the metal or metal salts which he was using.

"That is to say, for instance, at one time I will use a form of lead and another a form of

aluminum and at still other times, still other forms of aluminum salts such as aluminum oxide, aluminum acetate, aluminum sulphate, etc."

Your Honor understands these conclusions of this expert are based upon that false assumption that "A I" means acetate of alumina. Manwaring says:

"It is also to be noted that *early in his experiments* Mr. Macdonald turned from lead salts or lead, and experimented with *various forms of salts of aluminum* so that the Exhibit Note Books clearly *show the use of every feature described and claimed in the patent in suit*, which to my mind clearly evidences the fact that Macdonald did conceive and reduce to practice in the early 90's the process set forth in this patent."

The Court: When did Macdonald commence his correspondence with Melzer?

Mr. Dyer: Macdonald commenced his correspondence with Melzer in September, 1894. His letter to the newspaperman was in August and his letters to Melzer began in September, 1894.

The Court: It would seem from the date of this first letter that Macdonald wrote to Melzer on September 11, 1894.

Mr. Dyer: Yes, but he had heard of Melzer through this newspaperman to whom Macdonald had written, Doctor Gathman, in the month of August.

The Court: In the letter of September 11, 1894, he says that he would then add slowly 40 pounds of acetate of lead. He said nothing about acetate of alumina and this memoranda I have before me on page 30 of the note book is dated June 29, 1894, and uses the abbreviation "A I."

Mr. Dyer: Yes, which means acetate of lead.

The Court: And also on the subsequent pages, on March 6, 1894, and on July 6th, is "A I".

Mr. Dyer: Yes, all his experiments at that time were with acetate of lead; he admits that.

I was going to say to your Honor that Macdonald corrected his statement. Having thus lead his expert into the belief that "A I" meant acetate of alumina, which Mr. Massie could have verified in two minutes by getting Macdonald on the telephone, having put Manwaring on the stand to give this ridiculous testimony based on a false assumption, Macdonald, when he is put on the stand says that the letters mean acetate of lead, and he admits also that the index in the book before your Honor was written in the book long after the book was written.

Now, I confess frankly that I do not believe that story. Here was a situation going to the very vitals of the case. We were claiming that Macdonald had not invented the use of alumina; we were claiming that Melzer or English had made the suggestion to him and that he had used lead only. Mr. Massie takes up a note book in which "acetate of alumina" appears in the index. Without consulting with his client, in a stipulated deposition, he has that client state that "A I" means acetate of alumina when in five minutes the mistake could have been corrected and there would have been no necessity for Manwaring's long deposition explaining the note book on that false assumption. Then, after that stipulated statement by Macdonald, Manwaring is put on the stand and asked to explain the note book on the assumption that "A I" means acetate of alumina, which he does, and says that Macdonald all along experimented with aluminum, being lead to this false conclusion by the stipulated statement.

Then Macdonald is recalled and on re-cross examination admits that it is all a mistake and does not mean acetate of alumina at all, but means acetate of lead and that the index was put in the note book after it was written.

My impression is that Macdonald intended that to go as a false statement. He would be capable of it.

Mr. Massie: If the Court please, it was all a mistake of mine which I will explain later.

Mr. Dyer: I do not think you did do it intentionally, Mr. Massie, of course.

Mr. Mauro: There is no dispute about the facts there.

Mr. Dyer: If I am entirely wrong in my contentions and your Honor believes this patent is valid and this man Macdonald is really a very meritorious inventor and Macdonald and not Melzer made the invention and Storms didn't go up to Bridgeport after all to disclose this composition, but that Macdonald had made everything Storms brought, before he came there, we still have an absolute defense and that is the defense of the license.

Complainants cannot proceed against us under a license. The license contract appears in the record and was made on December 2nd, 1896. That was a truce—articles of truce between the two parties under which it was hoped that the litigation between them might be stopped and licenses were exchanged between the parties. We gave them licenses for such and such patents of ours as they were infringing and they gave us licenses for patents we were infringing and in that license it is provided as follows:

"It is further agreed that neither interest will bring suit against such types of apparatus

or supplies as have been put out commercially by the other interest before the date of this contract, whether put out by either interest before or after this contract."

Now these gentlemen admit that we were putting these supplies out at that time, because we were putting them out in 1889, so that it seems to me that is a complete estoppel against the complainant bringing this suit against us.

I have taken so much time that I can only run hurriedly over the propositions that we make.

One of our propositions is that the complainants acquired surreptitiously and dishonestly through the medium of Storms a secret process, knowing it to be a secret process and that, if we had known of that fact in time, we could have enjoined Storms from disclosing the process to them and enjoined them from practicing that process. The authorities are voluminous and there are many authorities in this State, especially in connection with the case of the Grasselli Company and in *Salamon v. Hertz*, and in the Grasselli suit the Court said (brief p. 99) :

"The injunction should not be refused because the process was such that it would probably have been discovered by independent experiments in the manipulation of the ingredients of which the products of both parties were alike composed. The Grasselli Chemical Company by its own conduct has put itself in such a position that it may even lose the advantage of future independent experiments. It would be quite impossible hereafter to decide how much of the improvement in the product of the Grasselli Chemical Company would be attributable to its own independent efforts and how much to the knowledge of Stone's process fraudulently acquired by it. Every doubt must be

resolved against the parties to a fraudulent act. If the defendant thereby suffers, it suffers only by reason of having been a party to Goss's fraudulent disclosure of the secret."

Whether we have any rights to affirmative relief in this case is a question I cannot consider now but it is perfectly clear from the authorities that these complainants have been guilty of fraudulent acts; that they were guilty of a fraud in acquiring the invention from Storms; that they could be enjoined from practicing that invention if action could have been brought seasonably against them, and being guilty of fraud, and the patent being based on fraud, they certainly have no standing in this Court.

As to the principles concerning employer and employee, Mr. Church will say a few words concerning that, and I think, your Honor, whatever other authorities we have are so fully considered in the brief as not to warrant me taking the time of the Court in referring to them.

Our fundamental proposition is that the story is an iniquitous one, a story of greed, outrage and gross fraud, that these people are here with a fraudulent patent and have no standing whatever in this Court. That patent represents nothing that they have originated. Everything in the patent is something they have either acquired from Melzer or stolen from us through the medium of Storms and Fargo.

I thank your Honor.

**ARGUMENT OF MELVILLE CHURCH, ESQ.,
FOR DEFENDANT.**

Mr. Church, speaking for the defendant, said:

May it please your Honor, my remarks will be very brief, because my brother has gone over this case so thoroughly and laboriously and industriously. They will be directed first to the question of what Macdonald had when he went to Melzer.

It is perfectly clear that Macdonald had only experimented with materials involving lead—he had experimented a good deal with that, I think. He had exhausted that subject, he thought. It appears he had a contract with his company whereby he was to supply the company with material; he thought he had got the material. He tried it and it worked successfully at first, but presently this bluish mold began to appear upon the surface of the records and he was in danger of losing his contract with the company. That was the moving cause of his anxiety. He was in danger of losing the contract he had made with his company for the furnishing of his company with the material for records. So we find him advertising for help, and I wish to call your Honor's attention now to the form of that letter which he wrote to Doctor Gathman who published the druggists' periodical. You will find the letter on page 377 of the record. It was in August, 1894, and this was the letter he wrote:

“We have been kindly referred to you by the Enos F. Jones Chemical Co., of New York. We desire to obtain the services of a competent man, who is thoroughly informed in the principle of hard soap making. Our work is not soap making, in the ordinary sense, but still the material we use is a true soap made

from stearine. We use it for making records upon the graphophone and phonograph. We desire a man who is capable of carrying on a certain amount of experimental work intelligently. One who is thoroughly posted in all the details of the manipulation of soap materials. Can you suggest?"—

Now, mind you, this is a suggestion.

"Can you suggest any material that would be likely to prevent, when mixed with soap material, the discoloration or cloudy appearance on the hard, clear surface of such soap?

The mixture I use is made from stearine, caustic soda, ozokerite, and acetate of lead."

He was telling Doctor Gathman what he had used, acetate of lead, and he proceeds to give the details of the mixture as follows:

"I mix the stearine and ozokerite, eight of stearine and one of ozokerite, then add about $\frac{1}{8}$ the weight of caustic soda; after this has boiled for twenty-four to thirty hours, I add about 10 per cent. of acetate of lead or common litharge. The mixture is an exceedingly hard brown mixture. I mail you in a separate box a number of samples. Now, our chief difficulty arises after some days. The mixture is moulded into cylinders and shaved off smoothly, but after standing for a time it will become covered with a cloudy mould, which will always re-appear even after repeated brushing.

If you could suggest anything that will cure this we will be greatly obliged."

Doctor Gathman did not have any suggestion to make. But the importance of that is that Mr. MacDonald in his extremity was telling anybody that he could talk to what he had done and where he had failed. But he had used only lead. Doctor Gathman did not make any suggestion, so the advertise-

ment was put in the Soap Journal. But Mr. Melzer, being a competent chemist, and known to be such, went into Dr. Gathman's office and he was shown this letter that Macdonald had written to Gathman and thereupon a correspondence was opened directly between Melzer and Macdonald.

The Court: Melzer writing first?

Mr. Church: Yes; saying that he had received from Doctor Gathman this letter, and he proceeds to say he would like to take up the process.

Now, let us see what the communications were. Macdonald wrote to Melzer September 11, 1894, as follows:

"Dear Sir: Pardon my delay in answering your esteemed favor of Sept. 1st. I have been away from the factory for a week and the matter was held awaiting my return.

We are endeavoring to obtain a composition for the purpose of making records upon the Graphophone that shall be an improvement on that we now use.

Our chief difficulty lies in clouding or corrosion of the surface after it has been shaved ready for the record.

We have been using the composition noted in my letter to Mr. Gathman."

referring to the lead composition;

"That gives the best results we have yet obtained.

In case we should agree that you would undertake the work for us, of course we would furnish you with all the data in our possession regarding the mixture.

Answering that portion of your letter I would say that we do not use water at all.

We melt, usually, 320 lbs. of 'A. A.' brand stearine, not stearic acid. When thoroughly melted we add about 50 lbs. black ozokerite. We then add slowly 40 lbs. of acetate of lead,

and when thoroughly united add caustic soda in powder to the extent of about 32 lbs. The mixture is then cooled and molded."

and so forth.

Then we have another letter from Macdonald to Melzer on page 388 of the record, being a letter of September 19, 1894, where he says:

"We think your proposition a fair one and will be glad to have you go ahead on the experimental work.

We ship you to-day by Adams' Express a box containing samples of all the mixtures we have used, also samples of the raw materials. With each sample I have attached a memorandum stating how the mixture was made.

There are several essential requisites in the soap for our use. First of all it must admit of a good record. To this end it is necessary that it be a hard homogeneous, close grained mixture. There must be no tendency to gumminess, or stickiness. If there is the recording tool will at once be clogged up and the record be seriously affected.

The mixture, after the record is placed upon it must not mould, effloresce, or change character in any way. If it does the fine and delicate record placed upon its surface will be destroyed. This has been our greatest trouble.

The mixture must be of such character that it will mould easily. To this end it is necessary that it pass from the melted, liquid, state to a jelly-like consistency, and thus harden slowly. This admits of easy removal from the mold.

I have found the best mixture to be as follows:

Stearine 24 lbs., Caustic Soda 40 ozs., Acetate Lead 40 ozs., Ozokerite 3 lbs."

Then he goes on to tell the process of mixing he had employed, and then he makes this general conclusion:

"Our mixture is in fact a saponified Stearate of Lead with the addition of a little Ozokerite or Ceresine (which is refined Ozokerite)."

Now, may it please your Honor, there is not a word in these letters about aluminum, and yet aluminum enters into everyone of the claims of the patent either in terms or impliedly. The whole spirit of this specification makes it perfectly plain that the invention is the use of aluminum. Did Macdonald appreciate that work of Melzer? Yes. He recognized him as the Moses who has led him out of the wilderness, and we find that recognition on page 409 of the record in a letter of December 22, 1894, where he says:

"Your favor received. I regret that there should be any misconception in this matter of cylinder material. I thoroughly appreciate your work on the cylinder, and consider it first-class in every way.

Perhaps I should have explained the precise position I am in in regard to the Cylinder matter before writing the last letter.

I worked out the formula I sent you which makes the wax that 'sweats' some time ago. At that time the company were using the soft ozokerite cylinder for commercial purposes, and were buying phonograph cylinders for the purpose of finer work."

That means they were buying from Edison people, of course; the Edison cylinders are called phonograph cylinders and the complainant's cylinders, graphophone cylinders.

"When I got the acetate of lead mixture I thought I had something that was equally good."

That was his maximum—the acetate of lead mixture.

H, ESQ.,

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"And to make it short I was given a contract by the Company to make the cylinders provided that I could give them a cylinder for musical purposes that would be equally good. I thought that I could do so, and commenced work. The sweating did not develop for some time, not until a large number had been made and sold. As soon as it did the cylinders began to come back. Of course this stopped further work on my contract. I was then in the position where I must at once furnish good cylinder material or pay for the damage. When I telegraphed to you I had just been formally notified under the terms of the contract that I would be obliged to furnish a suitable wax by January 1st next or have the contract cancelled and pay the damage resulting from the loss of music and other records placed on the soft cylinders.

The loss has already been considerable, and may be more. I think that the composition that you have sent will do the work, and to say that I appreciate your work is to say but very little of what I feel. I most gladly accept your offer to receive one of our machines in payment. I am sending you to-day one of our most complete outfits. I enclose with this a number of the cylinders which I have made up from time to time on your compound. These I have marked so that you will know them. Also send the cylinders made from the last mixtures that you sent. I found on investigation that these had not been sent as I wrote, and so I send them now."

There is the recognition wrested from him. Even Macdonald could appreciate the work that Melzer had done. It involves the recognition that the lead compositions were a total failure; that but for the aluminum composition he would have lost his product. It was honest appreciation. Melzer was a German chemist, and he worked laboriously as German chemists work. He kept an accurate account of everything he did and of each formula he

used, the temperature, the length of the process and the proportion of the ingredients. It was a laborious daily log or journal of his work and it is kept like the books of a bank, perfectly. I am sorry we have not the originals, but we have transcripts from them and there is nothing fragmentary or loose about them. They are perfect specimens of the record work of a scientist.

Now, let us look at the patent for a moment, because I am not going to bother your Honor with running over the details that Mr. Dyer has so fully covered. But I now wish to make the point that this patent itself and the application for it, drawn by Macdonald, recognize the total failure of his work with lead. It practically disclaims everything that Macdonald had done up to the time that he met Melzer. It was a recognition that all that was done involving the use of lead was an utter and total failure.

Let us see if this statement is made good. I refer to page one of the patent where it reads:

"It has been heretofore proposed to use as a sound recording material an insoluble soap made by saponification of any fatty acid by means of an earthy alkali, such as lime. It has also been proposed to employ a metal such as lead, combined with stearic or oleic acid, and particularly a mixture of oleate and stearate of lead; but tablets made of insoluble lime-soap or of stearates or oleates of lead have never yielded commercially successful results. Several practical difficulties have been encountered in endeavoring to make tablets composed wholly or in part of soap. The chief difficulty has been that the surfaces of such tablets become coated after a greater or less length of time with a bluish film having the appearance of mold and which has been termed 'efflorescence.'"

That was the defect which was found in the Macdonald cylinders which came back and because they kept coming back, Macdonald was about to lose his contract, and he says:

"This is due to the presence in the material of hygroscopic compounds, which on being attacked by moisture work out to and spread upon the surface of the tablets."

Now comes the most important statement, for he says:

"I have found that lead in any form, as well as most of the salts of other metals which might be otherwise suitable for the purpose in view, give rise to hygroscopic compounds. This is particularly true of stearates and acetates of lead."

There is the general condemnation of the materials with which he experimented involving the use of lead. Those are the things he recognized as failures; those are the things he professed to improve by the use of this patent.

Now, may it please your Honor, as we come to look at the file wrapper of this case, we find this development. Certain objections had been made (I am reading now from page 580 of the record) to some of his claims and his attorney wrote a letter to the Patent Office, in which he said (page 581):

"The Examiner construes Edison's patent as an anticipation of certain claims on the theory that 'to omit the oleate would not be invention.' We agree to that and indeed it is not necessary to argue this because Edison's patent expressly says that the oleate may be omitted.

When the oleate is omitted we have simply 'the stearate of the metal.' This being true,

the Examiner must construe the rejected claims as covering simply a recording blank composed of stearate of a metal. Not only is there no such claim in the case, but applicant points out that most of the metallic salts give rise to hygroscopic compounds, and would therefore be unsuitable. He says 'This is particularly true of the stearates and acetates.'

You will remember that expression in the patent?

The Court: Yes.

Mr. Church: The letter continues:

"Referring to the claims in detail, claim 2 specifies treating stearic acid with a compound of a metal, such as aluminum, and caustic soda lye. This process is certainly not disclosed in the phrase 'stearate of a metal.'

Claim 11 covers a definite composition of stearic acid, caustic soda and aluminum. No such composition is defined by the phrase quoted above."

A little further on there is another communication to the Patent Office, appearing on page 583 of the record which says:

"We are in receipt of official letter of the 8th inst. and file herewith a drawing"—

I should have called your Honor's attention to the fact that on page 582 there is a communication from the Patent Office:

"Applicant is requested to file a drawing in this case showing a conventional phonogram blank suitably marked as containing soda lye and a stearate of aluminum. This is to be used in searches and examinations in case the application results in a patent."

In reply to that communication the applicant says:

"We are in receipt of official letter of the 8th inst. and file herewith a drawing such as called for. The requirements that the tablet be marked as containing soda lye and stearate of aluminum indicates that we have not yet succeeded in making it clear that applicant does not use, but on the contrary avoids the use of, stearates."

He made a mistake there because we find he had used the words "stearate of aluminum," but he did not intend to include the stearates of lead, so we find the following on page 585:

"Since our last communication we have reviewed this case with the inventor and find that we have fallen into an error of fact which, while it has no bearing upon the patentability of the invention, should be corrected. We have several times stated in our letters to the office that the applicant avoids the use of all stearates. This was an error, the reference on page 2, line 9 of the specification being intended to apply to lead salts. Applicant does, in fact, use stearate of aluminum."

So that the condemnatory passage of the patent was intended to apply, as this shows, to the stearate of lead and the use of lead salts.

That very brief review, it seems to me, will satisfy you on our fundamental proposition; that Macdonald had used only lead and lead salts in composition; that when he expressed to anybody—to Gathman or Melzer or anybody else—his highest work, he always referred to the use of lead salts. But when he came to apply for the patent, realizing that the composition employing lead or the salts of lead was a useless composition, and had nearly

wrecked him, he sought to throw that away as not belonging to anybody, or as being a worthless thing, and he characterizes it as such in his patent. Therefore, the conclusion is that he must not now go back to his work on the salts of lead and claim that as being within the invention of this patent. That is the point.

He is estopped from making that claim because it is the very thing upon which he, according to the patent, was seeking to improve. It is not within his patent, and his work with respect to it is not within the invention of this patent.

The next point to which I would address my remarks has relation to the question of the communication of an invention.

It is claimed here that Macdonald thought he was the inventor of everything that Melzer did. I think your Honor must be satisfied on that point. The law in regard to such a communication, or to put it differently, the law of employer and employee as we have it in the patent law, is this: if an inventor who has nearly reached the solution of his problem, and who has a well-defined notion of what he wishes to do and has a notion of the means whereby he wishes to carry that into operation, employs a skilled workman, such as a mechanic or a chemist, to carry out that well-defined invention that he has in mind; in that case the work of the skilled mechanic or chemist belongs to him. He has done the work of invention, he has solved the problem excepting as to the working out of its details.

If it were not so, inventions would never be developed because it is the experience of those who have to do with the patent law that some of the finest inventions in the world are those produced by

persons who are not skilled in the particular art to which the invention relates. For instance, Mr. Bell was a professor in a college and taught the art of the production of sounds, but he did not have an adequate knowledge of electricity. He went to those who had knowledge of electricity and obtained their assistance and added the ordinary knowledge of an electrician to his knowledge of the art of producing and transcribing sounds and evolved the telephone. He used the skill of someone else. That was all right, but in this particular case, the case at bar, Macdonald had reached his limit, he had no invention to present to Melzer. The problem that Melzer had was not to take up the work of Macdonald and carry it on on the lines of Macdonald, but he said practically to Macdonald, "You are on the wrong track, you are using materials that will never produce any good results. I have tried them; I have tried to work out your line of invention, the use of lead salts, and have encountered the same result."

Therefore, he struck off in a new direction and if anybody made the invention of this patent, it was Melzer. The very thing that is the subject of this patent is the subject that Macdonald did not communicate to Melzer, it is the subject which grew in Melzer's brain. He evolved it; so that if this subject matter was patentable, it was the invention of Melzer and not the invention of Macdonald, and for the purpose of this case it makes no difference whether it is intrinsically patentable or not. Whatever is in that patent, whatever is claimed in the patent, since it involved the use of aluminum, was the invention of Melzer. In other words, Melzer did the whole thing that is claimed and Macdonald did nothing. The only things in that patent you can point to as Macdonald's are the things

which he himself in his own language, characterizes as failures.

There is one other subject to which I will address a few remarks, may it please your Honor, and that is the subject of secret invention, and what the law is in respect to it.

We insist that not only did this invention come from Melzer but that it came also directly from our factory through trusted agents who disclosed the work that Mr. Edison had been carrying on in his factory, in secret, for years.

Inventors may keep their inventions secret if they can. They run a certain amount of risk in doing so, but there are many inventions that inventors find it well to keep secret, especially those relating to processes, because if they expose their process in a patent, the world will get hold of it and will infringe in secret and it is therefore very difficult, if not impossible, to obtain evidence of the infringement. It cannot be told from the product or what is marketed, how the thing is made. So that, if this process had been patented, the Graphophone Company would have known long ago how Edison made the cylinder. They tried to analyse it but could not exactly get at it. So an inventor is justified in many cases in keeping his invention secret. If it gets away from him, it becomes public property. But if it is stolen from him the person who steals it, or the person who acquires that knowledge from the thief can never have a patent that is valid. Why? Because our law fortunately says that a patent can be granted only to the original inventor and one who acquires knowledge of an invention from one who has stolen it is not the original inventor. So Macdonald, if you find he got this invention through Storms or through Dodge or through anybody else from the Edison

factory, cannot pose here as an inventor at all. He is no inventor; he is one to whom the invention of another has been communicated.

But there is another aspect of this law of secret invention. If A makes an invention and keeps it in secret and apart from the world, so that the world may not get knowledge of it, and B independently invents the same subject matter and reduces it to practice and applies for a patent and gets the patent, that patent may be valid. The secret use of an inventor in his own laboratory, without communication to any other person at all, has been held in some cases,—although the law is not well settled on that point yet—not to be a bar to the grant of a valid patent to another who is an independent inventor, upon the principle that the first inventor who has kept his invention secret has not contributed anything to the knowledge of the world. He has hidden his light under a bushel and therefore the independent inventor who invents independently and patents the invention may hold that patent even as against the man who has the invention previously and used it in secret.

But there is no question that Macdonald was not an independent inventor. He acquired his knowledge from two sources: first, from some of Mr. Edison's employees and secondly from Mr. Melzer. So that the law of secret invention does not apply to this case.

I noticed in my brother's brief that he has referred to some cases of interference which have arisen in the Patent Office where there is an interference between A and B and one of the parties has introduced evidence to show that C invented the subject matter of the patent. In those cases the Courts have thrown out the evidence in respect to C's invention; they say it is not pertinent, that C

is not a claimant for the patent. Therefore the testimony as to what he may have invented is immaterial as to who, as between A and B, was the inventor.

That disposes of all the decisions produced here of Patent Office cases, on interferences.

It is hardly necessary for me to add anything to Mr. Dyer's admirable characterization of the conduct of these complainants. This whole case, from start to finish, is honey-combed with fraud. Not only was it conceived in fraud, but fraud has been kept up all through it. This disgraceful disclosure about this book which has just been made before your Honor is a specimen of the way in which it has been sought to mislead the Court and the Lord knows what would have happened to us if we had not gotten Mr. Macdonlad on the stand again and had him admit under cross-examination that that was a false index, that "A I" did not refer to alumina but to the old lead proposition, the result of which was failure.

I thank your Honor.

Circuit Court of the United States

DISTRICT OF NEW JERSEY

AMERICAN GRAPHOPHONE CO.,

Complainant,

vs.

NATIONAL PHONOGRAPH CO.

Defendant.

IN EQUITY,
Nos. 10 AND 11.

SUPPLEMENTAL BRIEF FOR DEFENDANT ON
THE QUESTION OF SECRET PRIOR
KNOWLEDGE AND USE.

FRANK L. DYER,
MELVILLE CHURCH,
For Defendant.

Circuit Court of the United States,

DISTRICT OF NEW JERSEY.

AMERICAN GRAPHOPHONE COM-
PANY,

Complainant,

vs.

NATIONAL PHONOGRAPH COM-
PANY,

Defendant.

In Equity

Nos. 10 and 11.

SUPPLEMENTAL BRIEF FOR DEFEND-
ANT ON THE QUESTION OF SECRET
PRIOR KNOWLEDGE AND USE.

The Court suggests the desirability of additional briefs on the subject of the effect on a patent of prior knowledge and use when confined to factory operations, where efforts have been made to preserve the same in secret, and where, as in the present cases, the product has been continuously and publicly sold. Specifically, the question for discussion here is this: Admitting, for argument's sake, that Macdonald did disclose to Melzer in 1894 the "four corners" of

the successful recording composition, that Melzer's work was merely the development which was to be expected from a skilled employee and which Macdonald was entitled to claim as his own, and that the inclusion in the patent of the Edison formula can be adequately explained, is the patent in any way to be prejudiced by the fact that the Edison Phonograph Works and the Edison Manufacturing Company have been continuously and actively engaged in the manufacture of the patented composition by an identical or equivalent process ever since the year 1889?

Complainant contends that prior knowledge and use under these circumstances where the effort was made to practice the invention secretly, cannot affect the Macdonald patents to the slightest extent, and that notwithstanding defendant's continued practice of the invention, defendant can now be enjoined from such practice after an enjoyment of the right to do so for upwards of nineteen years.

Defendant, however, contends that it is the undoubted right of any manufacturer to maintain an invention as a factory secret; that good business judgment prompts such a course when infringing operations would be difficult to detect; that the only penalty to which such a manufacturer could be subjected in case the secret were independently discovered would be to lose the commercial advantage incident to its individual practice by him; and that such prior knowledge and use constitute an absolute bar to the grant of a valid patent to a person independently making the same invention.

Mid-way between these views, was the suggestion made by the Court, that possibly a patent obtained under the circumstances might be valid notwithstanding the prior secret knowledge and use, although as to the defendant who had practiced the invention there could be no injunction.

In this country a patent is granted solely to the first and original inventor, and no monopoly can be secured for an invention previously known or used. This is so even when the prior knowledge and use are preserved as a factory secret.

Section 4886 of the Revised Statutes, provides:

"Any person who has invented or discovered any *new* and useful art * * * * *not known or used by others in this country*, before his invention or discovery thereof * * * * may * * * * obtain a patent therefor."

Section 4920 of the Revised Statutes provides:

"In any action for infringement the defendant may plead the general issue, and, having given notice in writing to the plaintiff or his attorney, thirty days before, may prove on trial any one or more of the following special matters:—

* * * * *

Fourth: That he (the patentee) *was not the original and first inventor* or discoverer of any material and substantial part of the thing patented:

* * * * *

And in notices as to proof of previous *invention, knowledge or use* of the thing patented, the defendant shall state * * * * the names and residences of the persons alleged to have invented or *to have had the prior knowledge of the thing patented*, and where and by whom *it had been used*; and if any one or more of the special matters alleged shall be found for the defendant, judgment shall be rendered for him with costs. And the like defences may be pleaded in any suit in equity for

relief against an alleged infringement; and proofs of the same may be given upon like notice in the answer of the defendant, and with the like effect."

In Walker on Patents, the leading text book on the subject, (Fourth Edition, 1904, page 66) the rule is stated:—

Section 71: "Novelty is negated by *prior knowledge and use* in this country *by even a single person* of the thing patented. *This rule applies even to cases where that knowledge and use were purposely kept secret*; and it applies *no matter how limited* that use may have been.

In *Gayler vs. Wilder*, (10 Howard 477) the Supreme Court announced an exception to this rule, but in a later case (*Coffin vs. Ogden*, 18 Wall. 125) it intimated a denial, or at least a doubt, of the validity of that exception. According to the opinion of a majority of the Court in the first case, a single instance of prior knowledge and use will not negative novelty *if that use had ceased when the patent was granted, and that knowledge was forgotten until called to mind by the re-invention.*"

In Robinson on Patents, a more pretentious but less authoritative work on the subject, Volume 1, page 434, the rule is thus stated:—

Section 320: "But even the practical employment of a complete and operative art or instrument does not confer the invention on the public, unless the use of the invention be in public. A use *in* public is not necessarily a use *by* the public. It is distinguished, not from an individual, but from a secret use. It is a use which places the invention in such a relation to

the public that if they choose to be acquainted with it, they can do so. Thus while a use *by the inventor* in the seclusion of his private laboratory or workshop, as a secret of his trade, does not show public knowledge, the practical employment of the invention by others than the inventor, in their trade or profession, *though in concealment from the general public*, is, in the present sense, a *use in public*."

It is not necessary to consider the special exception referred to by the text writer of the effect of a prior secret use practiced by the inventor alone in the seclusion of his workshop, although it is to be noted that the exception is supported by English and not by American decisions. At the same time it might well be admitted, that if an inventor discovered, for example, a process for making diamonds artificially and practiced the invention in secret and unknown to any one else, a patent granted to a later inventor might be valid. The patent could, however, be more logically supported by the inevitable weakness of any proof of prior knowledge which would necessarily have to come from the inventor alone, than by making any exception to the general rule that a patent must be granted to the first and original inventor. When, however, the inventor takes someone else into the secret, it then comes into the domain of public knowledge, and it is immaterial how close the veil of secrecy may be drawn around its practice. As the invention is disclosed to, or practiced by, additional persons, the extent of its knowledge is correspondingly increased. When the invention is patented, it may be practiced for a limited period to the exclusion of every one. If it is practiced openly and not patented, it may be practiced without restriction by the public. If, however, it is practiced secretly and

the secret is discovered, the discoverer of the secret may, in his turn, practice it secretly, but if he discloses it to the public in a patent or otherwise, then the public at large may practice it. An inventor has always an option of keeping his invention a secret, or, of patenting it and securing a monopoly. In electing to keep it a secret, the inventor runs the risk of betrayal and the possibility that the secret may be independently discovered before the expiration of the period for which he could obtain protection under the patent laws. Such was the case here—the Edison composition was independently produced by Melzer within five years after its invention by Aylsworth. The monopoly was therefore enjoyed for this limited period, whereas, if a patent had been obtained it would have continued for twelve years or more, longer.

On the subject of "lost arts" (the possible exception to the general rule suggested by the Supreme Court in *Gayler vs. Wilder*) Robinson (Vol. 1, page 444, Sec. 323) says:—

"The length of time for which an invention has been lost, and the degree of public ignorance which may prevail, are of no consequence, provided only that it be actually lost out of the practical knowledge of the public. Thus, if an art or instrument has been invented and employed in this country within the present generation and *then has been abandoned and forgotten*, though its re-invention recalls it to the memory, not only of its first inventor, but of others who were once familiar with its use, it is a new invention, and is now conferred upon the public as truly as if never known before."

Obviously there is no such situation here; the invention was never abandoned nor forgotten, but on the contrary, was continuously practiced. As a matter of fact, in the few cases where this doctrine has been invoked to negative the defense of prior knowledge or use, it will be found that the original use was confined generally to a single machine known to but few persons; that the machine was forgotten and abandoned, and that it was revived for the sole purpose of defeating a meritorious patentee, and of enabling an infringer to profit from his invention.

In *Gayler vs. Wilder*, 10 Howard, 477, the patent related to a fireproof safe employing plaster-of-Paris as a resisting material between the outer and inner walls. Fourteen years before the patent, Conner had constructed such a safe for his personal use. The Court say:

"It was kept in his counting-room and known to the persons engaged in the foundry, and after it passed out of his hands he used others of a different construction. It does not appear what became of this safe afterwards. And there is nothing in the testimony from which it can be inferred that its mode of construction was known to the person into whose possession it fell, or that any value was attached to it as a place of security for papers against fire; or that it was ever used for that purpose."

And the Court further say:

"And upon this state of the evidence the Court put it to the jury to say, whether this safe had been finally forgotten or abandoned

before Fitzgerald's invention, and whether he was the original inventor of the safe for which he obtained the patent; directing them if they found these two facts that their verdict must be for the plaintiff. We think there is no error in this instruction. For, if the Conner safe had passed away from the memory of Conner himself and of those who had seen it, and the safe itself had disappeared, the knowledge of the improvement was as completely lost as if it had never been discovered."

Dissenting opinions were written by Justices McLean and Daniel, and Mr. Justice Grier also joined in the dissent. Justice McLean said:

"If there be anything clear in the patent law, it is that the original inventor means the first inventor, subject only to the provision stated in the fifteenth section. This instruction presupposes that the safes are the same in principle. Now, if the invention was patented abroad or was described in a foreign publication, both of which were unknown to the inventor in this country, still his patent is void. So it is void if such invention has been known to any person in this country. The instruction says, if Conner's invention 'had been forgotten or abandoned,' it was no obstacle to Fitzgerald's right. Can a thing be forgotten or abandoned that was never known? If known before Fitzgerald's invention, it is fatal to it. By whom must it have been forgotten? By the inventor, or the public, or both? And how must it have been abandoned? When an invention is abandoned it is said to be given up to the public, and this is the sense in which the term 'abandonment' is used in the patent law. Such an abandonment would be fatal to the right of Fitzgerald."

Mr. Justice Daniel, in his dissenting opinion said:

"In the next place, it is said by the learned Judge, that if Conner had abandoned this improvement which the charge admits him to have invented, this would justify a patent to another who had not known of the improvement, although a subsequent inventor. I have always understood it to be indisputable law that wherever an inventor abandons or surrenders an invention or improvement which he has certainly made, and neither claims an exclusive right in himself nor transfers it to another, the invention or improvement is given to the public; but by the charge in this case such an abandonment transfers an exclusive right to one who, by the case supposed, is admitted not to be the first inventor."

In *Coffin vs. Ogden*, 18 Wall, 125, the Supreme Court question the soundness of the doctrine of *Gayler vs. Wilder* and say:

"The invention or discovery relied upon as a defense, must have been complete, and capable of producing the result sought to be accomplished; and this must be shown by the defendant. The burden of proof rests upon him, and every reasonable doubt should be resolved against him. If the thing were embryotic or inchoate; if it rested in speculation or experiment; if the process pursued for its development had failed to reach the point of consummation, it cannot avail to defeat a patent founded upon a discovery or invention which was completed; while in the other case there was only progress, however, near that progress may have approximated to the end in view. The law requires not conjecture, but

certainty. If the question relate to a machine, as thus exhibited, the conception must have been clothed in substantial forms which demonstrate at once its practical efficacy and utility. *The prior knowledge and use by a single person is sufficient. The number is immaterial.*

A secret laboratory use by the inventor alone is to be distinguished from factory operations carried on in secret. The former may not invalidate a patent to a later independent inventor, but a secret factory use will always invalidate such a patent. The extent of public knowledge of the Edison composition.

Robinson (Section 320, *Supra*) distinguishes between "a use *by the inventor in the seclusion of his private laboratory or workshop, as a secret of his trade,*" and "the practical employment of the invention by others than the inventor, in their trade or profession, *though in concealment from the general public.*" In the former case, the invention is known to but one man; the secret is locked up in his own breast; and should he die, the invention is lost and can never be given to the public. In the latter case, however, there is no secret in the sense of an absolute withholding of the invention from the public, but if known to one other man, it becomes as much a matter of public knowledge as if known to all men.

This must be so, because if prior knowledge and use by the inventor and one other person will not bar a patent to a later inventor, how extensively must prior knowledge and use be disseminated to constitute such a bar? Must the invention be known and used by *three* men, or *ten* men or *one hundred* men? Obviously, the test is not the *number* of per-

sons by whom the invention may have been previously known and used, so long as it satisfactorily appears that the invention was, in fact, previously known and used. The number of persons having the prior knowledge and knowing of the prior use, has to do solely with the sufficiency of the proof.

In the present case, it will be remembered, that we are dealing with corporations and not individuals, and that from its very inception the invention has been practiced for the benefit of corporations. The record shows that the invention was known to, and practiced by, the following persons:

(1) By Mr. Edison, who closely followed all of Aylsworth's experiments and was familiar with the details of manufacture from the earliest period. Mr. Edison was not sworn to secrecy, he is a member of the general public, and he was free at any time to communicate the invention to the public.

(2) By Mr. Aylsworth, who invented and developed the composition, who carried on the manufacture until January 1891, and who has superintended operations since October, 1895. Mr. Aylsworth was not sworn to secrecy, but was satisfied to loyally respect Mr. Edison's wishes, that the invention should be kept a factory secret. Mr. Aylsworth could have violated that confidence at any time and have communicated the invention to the public. He certainly had prior knowledge of the invention.

(3) By Mr. Miller, who succeeded Aylsworth in January 1891, and continued to manufacture the composition until October 1895. He also had prior knowledge of the invention.

(4) By Mr. Higgins, who made the composition under Miller and who was familiar with all of its details. He also had prior knowledge of the invention.

(5) By Mr. Aschenger, who took up the manufacture of the composition at Orange in July 1896, but who has not been heard from since leaving the employ of the Edison Phonograph Works. While his knowledge may not have been prior to Melzer's work, it was certainly prior to the filing of the application for patent No. 606,725 and was prior to any date of invention asserted for patent No. 626,709.

(6) By Mr. Storms, who states that he obtained knowledge of the process by freely passing through Aschenger's room, and who obtained the formula from Higgins. All these men were fully acquainted with the invention and at any time could have profited by their knowledge. It is gratifying to think that of this number only one should have betrayed his employer.

In *Tennants* case (Am. & Eng. Patent Cases, Vol. 1, p. 115) a secret factory use practiced by two partners and two servants, but otherwise unknown, was considered a prior use and the patent was invalidated.

In *Reed vs. Cutter*, 2 Robb, 86, the Court, Story J., said:

"Under our Patent laws, no person, who is not at once the *first*, as well as the *original* inventor, by whom the invention has been perfected and put into actual use, is entitled to a patent. *A subsequent inventor, although an original inventor, is not entitled to any patent.* If the invention has been perfected and put into actual use by the first and original inventor, it is of no consequence, whether the invention is extensively known or used, or *whether the knowledge and use thereof is limited to a few persons, or even to the first inventor him-*

self. It is sufficient that he is the first inventor, to entitle him to a patent; *and no subsequent inventor has a right to deprive him of the right to use his own prior invention.*"

In *Spring vs. Packard*, 1 Ban. & Ard. 531, the patent related to a lathe for turning irregular forms. The alleged prior device was "proved by Pernot and by another witness, and corroborated by circumstantial evidence." The Pernot lathe was operated secretly as appears from the opinion of Judge Lowell, who still regarded it, as of course it was, an indication of prior knowledge and use. The Court said:

"We are obliged to say, that Pernot's machine, which was not patented, and was somewhat guarded from view, perhaps for the very purpose that its mode of operation might not be generally known, was yet, by the law, such an anticipation of the plaintiffs' combination, that they were not the *first*, though they were original inventors thereof."

An interesting example of the extent of prior knowledge necessary as an anticipation of a patented invention is found in the recent case of *Automatic Weighing Machine Co. vs. Pneumatic Scale Corp.*, 158 Fed. Rep. 415, decided by Judge Putnam. The opinions of no other Federal Judge on questions of patent law command a higher respect than those of Judge Putnam. In that suit, the complainant operated under a patent to Thomas, and the defendant operated under a patent to Watson, both of which patents were identical. There had previously been an interference in the Patent Office between Thomas and Watson. The Examiner of Interferences, the Commissioner of Patents and the Court of Appeals of the District of Columbia,

all decided that although Watson had conceived the invention, made a drawing of it and disclosed it to his employer, Doble, prior to the conception of the invention by Thomas, yet since Thomas was the first to reduce to practice, and Watson was negligent in reducing to practice, Thomas was entitled to an award of priority of invention. After obtaining the Thomas patent, suit was thereupon brought against the owners of the Watson patent, and the important defense urged before Judge Putnam, and on which he decided the case, *was the prior invention of Watson*. Judge Putnam referred to the fact—

“that the Circuit Court of Appeals for the District of Columbia decided only as between two different persons claiming patents for the same invention, *while here we are compelled to decide as between a party holding a patent and the general public*. In the former case, each party to the issue was supposed to have been an inventor, and the question was one only of priority; *while with us the question is whether Thomas was an original inventor under the statutes as against the public at large.*”

And again, the Court asked:

“Can Thomas’ patent be sustained *as against the public*, in view of the fact that, as the record stands, his conception does not go back of his application for his patent, while Watson a long time previously, not only had a complete conception, but developed it to Doble in the way we have explained?”

Judge Putnam answered this question in the negative, saying (p. 420):

“We cannot, therefore, resist the conclusion that Watson was a true inventor within the law; so that in behalf of one who occupies the

position of the public at large, and who is entitled to all the defenses to which one who is merely alleged to be an infringer is entitled, as is the condition of the respondent in his proceeding, Thomas cannot be held to have been 'the original and first inventor,' within section 4892 of the Revised Statutes."

Here is will be seen the evidence of prior knowledge was limited to the inventor and his employer, and the invention did not exist in tangible form, *but only in a drawing*. It was not reduced to practice and might never have been. Notwithstanding this, Judge Putnam decided that while as a matter of priority, Watson was not entitled to a valid patent as against Thomas, because of his negligence in reducing to practice; yet, as against the public, Thomas was not entitled to a valid patent, because he was not the first and original inventor.

THE FALLACY OF COMPLAINANT'S ARGUMENT.

Complainant's position on the subject of prior knowledge and use of an invention practiced as a secret process is utterly fallacious. It is opposed to a continuous line of unbroken authorities (See main brief, pages 111-116) and it cannot be supported by logic or common sense. When the statute says that the invention must not be "known or used by others in this country," it cannot possibly be contended that such knowledge or use is any the less an indication that the patentee is not the first inventor, merely because the invention may have been practiced in secret by such persons to whom the knowledge has been imparted and who in turn may impart it to others. To decide other-

wise and to adopt complainant's position would open the door to frauds which could be practiced with impunity on the public. Suppose, for example, in the present case, Mr. Aylesworth had imparted his knowledge to Macdonald. That fact could probably never be proved and Macdonald could therefore pose as an independent inventor. He could then have obtained a patent, and with that patent not only monopolize the art for seventeen years, but actually prevent the Edison Company from continuing its factory operations. According to complainant, there would be no possible defence against such a patent, because they assert that the prior knowledge and use being a secret known only to certain of defendant's employees, and not to the public generally, could not invalidate the patent. A mere statement of such a possibility discloses the inherent vice of complainant's position. If their position were correct no manufacturer would even dream of practicing an invention as a factory secret, because if betrayed by a dishonest workman who might disclose the secret to a competitor, the latter might secure a patent by which the original manufacturer could be absolutely despoiled. According to complainant, this would be so, even if the invention were known to a thousand workmen, so long as it is practiced as a factory secret.

It is sufficient to say that no Court has ever gone so far as to hold that where a factory operation has been continuously practiced, and the product thereof sold, a subsequent patent therefor, though granted to an independent inventor, could be sustained as valid, and most certainly no case can be found where the attempt was successfully made under such a patent to enjoin the continued practice of the invention by the original inventor. Yet complainant asserts the correctness of their position with the assurance that the law on the point is

fully established. The authorities upon which complainant relies, however, have evidently not been very carefully considered by them, because they support no such proposition as that for which complainant contends. Complainant says (main brief page 11) :

"This situation is similar to that in *Bryce vs. Seneca* (140 F. R. 161, 172-3), where the Court refused to invalidate a patent for a machine, although defendant showed the prior use in secrecy of an anticipating machine. The Court distinguished very justly between the prior use of an *article* distributed among the public so that it could be inspected, and the prior use *in a factory* of a *machine* of which the public could have no information; and held that such latter use would not invalidate the patent to a subsequent inventor."

It is difficult to conceive of a more unfair and misleading statement of a case than is found in the above quotation. Complainant would have it appear that in *Bryce vs. Seneca*, the facts were identical with the present case except that it dealt with a machine instead of a process. And they would have it appear that the continued operation of such a machine if kept a factory secret and the sale of its product would not negative the novelty of a later patent granted to an independent inventor on the same machine. As a matter of fact, in *Bryce vs. Seneca*, the question to be decided was whether the Schrader patent which related to a glass engraving machine was invalidated by the use by the patentee in its factory of the patented machine more than two years before the filing of the application. It was not the case of the invalidating "of a patent to a subsequent inventor" as complainant states, but was purely a question of public use by the inventor and patentee himself.

Judge Dayton (whose opinion points out in a very entertaining way, the difficulties of a judge deciding his first patent case) considered the question of public use and following the decision of the Supreme Court in *Elizabeth vs. Parement Company*, 97 U. S. 126, decided that the use by the patentee of the machine was experimental, even though the product was sold. His conclusions on the point, as showing how unfairly complainant has put this case to the Court, were thus stated:

"Be this as it may, if I analyze the evidence in this case rightly, applying the distinctions drawn between the manufactured machines and the manufactured article, this defense of prior use must fall, because the evidence wholly fails to show prior public use of Schrader's machine more than two years before application for the patent. None of these machines were sold and none were built or used anywhere else than in the factory of his employer, the Bryce Bros. Company. A very considerable degree of secrecy was maintained, the etching room being kept under lock and key. The machines built after this design were finished but a few months prior to the two years, and it comes with overwhelming conviction that they must necessarily have been imperfect."

It is clear from Judge Dayton's opinion that the machines used by the patentee were held not to have been in public use solely because the use was experimental and the machines were imperfect, and not as complainant contends, because the use was secret.

Complainant also says, (main brief, page 12):

"The law on this point is clear. One man makes an invention but keeps it a *secret*, practicing the invention for *his own benefit*, but not disclosing it to the public; another man comes on later and independently makes the same invention but *promptly* discloses it to the public in return for the grant of a patent, so that

upon the expiration of his patent the public will be entitled to the *full benefits* of his disclosure. Under these conditions, the first man forfeits all right to the benefit of the patent laws; and the later inventor is entitled to a valid patent, because he has given the public *full legal consideration* for the grant of the patent. Firstly, he has performed the inventive act; and, secondly, he has *disclosed* his invention and demanded his patent. The prior knowledge requisite to anticipate a patent must be a knowledge of the invention *accessible to the public*, and not private knowledge, selfishly preserved in secrecy. The patent laws are for the benefit of the public, and not of the individual inventor who *conceals* his invention. They reward the man who *discloses* his invention."

It is enough to say that while the law on this point is clear, it is not correctly stated by complainant, and is certainly not supported by *Gayler vs. Wilder*, *Bates vs. Coe*, and the other cases referred to. The argument of complainant is elaborated in the appendix to the brief, but here again complainant has entirely misinterpreted the effect of the decisions. They refer to the cases as apparently supporting three quite original propositions:

(1) *Howe vs. Underwood*, 1 Fish. 160, is referred to in complainant's main brief, (page 46) as supporting the proposition without any qualification that the man who first puts the public in possession of the invention by disclosing it in a patent cannot be deprived of his rights and enjoyment therein, even by the original inventor. This, the Court will admit is certainly a radical, not to say, startling conception, but it is a fact that it finds no support either in *Howe vs. Underwood* nor in any other case.

(2) *Kendall vs. Winsor*, 21 Howard 322, is then referred to (complainant's main brief, page 48) as establishing the proposition that when an original inventor after completing the inventive act and fully reduces it to practice, conceals the machine from the public though he may operate it continuously, he cannot prevail over a later inventor who discloses the invention to the public in a patent. This, the Court will admit is an equally interesting and novel proposition, but it finds no support in *Kendall vs. Winsor*, nor in any other case.

(3) *Mason vs. Hepburn* (84 O. G. 147) and similar cases are then referred to (complainant's main brief, pages 52 *et seq.*) as establishing the proposition that where two inventors are contesting the question of priority of invention, and the first inventor after reducing the invention to practice deliberately conceals it from the public gaze, although he may continue to use it in factory operations, while the later inventor discloses the invention to the public in a patent, under these circumstances the second inventor is really the first inventor and is entitled to the patent. This is also an equally interesting proposition which finds no support either in *Mason vs. Hepburn* nor in any other case.

Having thus constructed a suitable ground-work of interesting but erroneous and unsupported propositions, complainant erects thereon the argument that defendant having undertaken the unholy and iniquitous course of preserving the invention as a factory secret, has forfeited all rights whatever in the invention the same as if the invention had never existed, and that the Macdonald patents rest upon a foundation of absolute novelty. These propositions of complainant will be briefly discussed:

I.

Howe vs. Underwood (1 Fisher, 160) was indeed a "famous case." In that suit the patent, which was granted in 1846, related to the original sewing machine invented by Elias Howe, Jr. As to the value of the invention, the Court said that:

"There is no evidence in this case, that leaves a shadow of doubt, that, for all the benefit conferred upon the public by the introduction of a sewing machine, the public are indebted to Mr. Howe."

Defendant in that case asserted that Howe's patent was invalid because the invention had been embodied in a sewing machine constructed by Walter Hunt in 1834, but which was only *experimentally operated*, was *abandoned* and *knowledge of its construction was only brought to light for the purpose of defeating Howe's patent*. Plainly, the question for decision by Judge Sprague was whether or

not the Hunt machine was a complete embodiment of Howe's invention or was merely an abandoned experiment. Of course, if it was an abandoned experiment the public could not have been in possession of the invention. Therefore, Judge Sprague said in the quotation found in complainant's brief, that:

"If it is an experiment only, and ends in experiment, and is laid aside as unsuccessful, however far it may have been advanced, however many ideas may have been combined in it, which, subsequently taken up, might, when perfected, make a good machine, still, not being perfected, it has not come before the public as a useful thing and is, therefore, entirely inoperative as affecting the rights of those coming afterward."

There cannot be the slightest doubt that if Judge Sprague had been convinced that the Hunt machine embodied the Howe invention, it would have been held to anticipate the patent, *but he specifically found that it was a different invention and for this reason was abandoned.* To compare the situation with the present case, admitting that Hunt's machine was the same as Howe's, and had been continuously used from 1834 onward by Hunt and his associates, even though not known generally to the public, could there be the slightest doubt that it would clearly anticipate the patent?

II.

Kendall vs. Winsor, supra, is as foreign to the situation here presented as *Howe vs. Underwood*. In *Kendall vs. Winsor*, the patentee had made one of the harness machines as early as 1846. In 1849 he made several other machines "on which he made harness to supply all such orders as he could obtain." These machines were used continuously by him. He "repeatedly declared to different persons that the machine was so complicated that he preferred not to take a patent, but to rely on the difficulty of imitating the machine, and the secrecy in which he kept it." Defendants made their machines in 1853 and 1854, and in the latter year the plaintiff knew of this fact. The application for the patent was not filed until November, 1854, but it does not appear when the patent was issued. The workmen operating the machine "pledged themselves not to divulge the invention." Under these circumstances, the court refused to sustain the patent and to enjoin the defendant from continuing the operation of the machines which he had constructed during the period of concealment. Obviously, if defendant had entered the field *after the patent had been granted*, the special equities which appealed to the court would not have existed. *In that case, there was no second patent granted to the later inventor which the court had to consider, nor is there any intimation that such a later patent would have been sustained if granted.* The sole question decided in *Kendall vs. Winsor* was that where an inventor deliberately elects to preserve his invention as a factory secret, and then ascertains that others have independently acquired the invention, a patent subsequently applied for by the first inventor cannot be sustained as against such other persons. It is true the Supreme Court say:

"Hence, if, during such a concealment an invention similar to, or identical with, his own, should be made and patented, or brought into use without a patent, the latter could not be inhibited nor restricted, upon proof of its identity with a machine previously invented and withheld and concealed by the inventor from the public. The rights and interests, whether of the public or of individuals, can never be made to yield to schemes of selfishness or cupidity; moreover that which is once given to or is invested in the public cannot be recalled nor taken from them."

Complainant seems to suppose that the above quotation establishes the point that if the second independent inventor obtains a patent, that patent will not be "inhibited nor restricted" by reason of the continuous use of the invention by the first inventor. Admitting that this is so, it is mere dictum; but it cannot possibly be so. The Supreme Court obviously had in mind the single question, whether the first inventor could enjoin the practice of the invention by the later independent inventor, and not whether a patent granted to the later inventor would be valid. In other words, they were alone considering the rights of the first inventor *as a patentee*, and not the rights of the second inventor except so far as they related to the continued practice of the invention by him. That such was the case is clear from a consideration of the entire opinion. For instance, the Court say:

"It is the unquestionable right of every inventor to confer gratuitously the benefits of his ingenuity upon the public, and this he may do, either by express declaration or by conduct equally significant with language—such for instance, as an acquiescence with full knowledge

in the use of his invention by others; or he may forfeit his rights as an inventor by a wilful or negligent postponement of his claims, or by an attempt to withhold the benefit of his improvement from the public until a similar or the same improvement should have been made and introduced by others. Whilst the remuneration of genius and useful ingenuity is a duty incumbent upon the public, the rights and welfare of the community must be fairly dealt with and effectually guarded."

Here it will be seen the Court were considering only the rights of the first inventor as against the public, and not the possible rights of the second inventor to exploit the public by means of a patent. Further on in the opinion, and as illustrating the same predominant idea, the Court quote from *Penock vs. Dialogue*, 2 Pet. 1, as follows:

"If an inventor should be permitted to hold back from the knowledge of the public the secrets of his invention, if he should for a long period of years retain a monopoly and make and sell his invention publicly, and thus gather the whole profits of it, relying upon his superior skill and knowledge of the structure, and then, and then only, when the danger of competition should force him to secure the exclusive right, he should be allowed to take out a patent and thus exclude the public from any farther use than what should be derived under it during his fourteen years, it would materially retard the progress of science and the useful arts, and give a premium to those who should be least prompt to communicate their discoveries."

It will be observed that in *Kendall vs. Winsor*, the Supreme Court were dealing with a situation which they characterize as a scheme of "selfishness and cupidity." They had previously recognized the same danger in *Pennock vs. Dialogue*, and it was necessary from considerations of public policy to prevent an inventor from unduly prolonging the monopoly by any such scheme. To permit a second inventor to obtain a valid patent on the very thing which they denied to the true and first inventor, would certainly work the very hardship and injury to the public which they were seeking to prevent. When the decision of the Supreme Court in *Kendall vs. Winsor* is considered in the light of the special facts of that case, it will be seen that it is based on considerations of public policy, and on broad principles of equity, and has not the slightest connection with anything for which complainant is here contending.

III.

The several decisions referred to by complainant in which the doctrine of *Mason vs. Hepburn* was announced and subsequently followed, are decisions of a single court, the Court of Appeals of the District of Columbia, having jurisdiction of appeals from the Patent Office. The decisions in question establish a single proposition and nothing else. Stated briefly, the proposition is that on the question of *priority as between two rival, but independent inventors*, where the first inventor completes the invention, embodies it in a practical form and then deliberately conceals it from the public, and where the second inventor independently makes the invention during the period of concealment and

gives the invention to the public either by patenting it or putting it into use, and the first inventor learning of his rival's efforts applies for a patent, he will not be permitted to carry the date of his invention back to the construction of the machine so deliberately concealed by him. *One pregnant fact will be observed in all of these cases which will be subsequently reviewed and that is, that in every instance the first inventor after making the device went no further with it, but was spurred into activity only upon learning of his rival's efforts to secure a patent or upon having that patent brought to his attention.* In every one of these cases, for aught that appears to the contrary, the first inventor never would have withdrawn the device from its place of concealment, if the second inventor had not independently put the public into the possession of the invention. In other words, *in all of these cases the doctrine was supported solely because the work of the first inventor was regarded as an unsuccessful and abandoned experiment,* the Court no doubt believing that the *presumption* of abandonment arising from the deliberate concealment was stronger than any *proof* of the successful reduction of the invention to practice. The substantial error in the doctrine thus announced by the Court of Appeals, is that when an inventor *has once completed and reduced his invention to practice,* and such reduction to practice is communicated to others, *he can never lose his status as the first and original inventor,* except by an abandonment, declared or presumed, to the public, and under no circumstances can such a first inventor dedicate his rights to a later inventor.

"An abandonment *cannot be in favor of one person,* but to the public, giving every one the right to use and manufacture the invention."

Ross vs. Montana Union Ry. Co., 45 Fed. 430.

Justice Daniel, in his dissenting opinion in *Gayler vs. Wilder*, Supra; on the same point said:

"I have always understood it to be undisputed law that wherever an inventor abandons or surrenders an invention or improvement which he has certainly made, and neither claims an exclusive right in himself nor transfers it to another, *the invention or improvement is given to the public.*"

So far as we know, none of the patents granted under the circumstances of *Mason vs. Hepburn* has been litigated to final hearing, but when that time comes, we venture the prediction that one of two things will happen: First, the trial court will consider carefully the device constructed by the first inventor and communicated by him to others, and will apply to that device the tests which Judge Sprague applied to the Hunt machine, in *Howe vs. Underwood*. If it is found that the device constructed by the first inventor was a complete and undeniable embodiment of the patented invention of which others have had knowledge prior to the patentee's invention, the patent will be declared invalid. Second, if, however, the court concludes that the device of the first inventor did not embody the patented invention and that therefore knowledge of the patentee's invention was not within the possession of others, it will be regarded as an abandoned experiment and the patent will be sustained as was done in *Howe vs. Underwood*. Such a prediction certainly seems a very conservative one, in view of the decision of Judge Putnam in *Automatic Weighing Machine Co. vs. Scale Co.*, Supra, wherein the patent was invalidated not by a prior machine or device, but solely because of a prior drawing coupled with a disclosure from the inventor to one other person.

It should be said that in these various interference cases, the Court could not have had the question brought prominently to their attention of the effect on the patent granted to the second inventor, of the construction and operation of the machine by the first inventor and its disclosure to others. That question would be conspicuously presented in an infringement suit, where, as in the present case as well as in the case decided by Judge Putnam, the work of the prior inventor is relied upon as a defence disclosing prior knowledge and use, and such, of course, would be the case whether the use was a secret use or whether the knowledge was limited or extensive. In this line of interference cases, the Court had only before them the single question whether after the second inventor had obtained a patent, another patent should be granted to the first inventor. Obviously, in those cases the patentee having secured his patent would not admit that the work of the first inventor constituted prior knowledge and use, because to have done so would have defeated his patent. On the other hand, the applicant, although the first inventor, would not admit that his early work was abandoned, because in that case there would be a dedication to the public. Furthermore, in these cases, the prior inventor would have gained nothing by defeating his rival's patent on the ground of prior knowledge and use, since what the prior inventor in each case was striving for was to obtain a patent himself. Consequently, the Court never had occasion to consider the effect on the patent of the prior knowledge and use connected with the work of the first inventor, but had before them only the single question of a struggle between rival claimants for priority, one having a patent and the other seeking to obtain a patent himself on the strength of a reduction to practice, which was wilfully concealed and was al-

lowed to remain dormant until awakened by the activity of the second inventor.

(a) In *Mason vs. Hepburn*, 84 O. G. 147, Hepburn's application was filed April 3, 1894, and the patent was granted on September 11, 1894; Mason's application was not filed until December 31, 1894, after he had observed the publication of Hepburn's patent in the Official Gazette. The testimony showed that Mason in July, 1887, had equipped a gun with the invention in issue and the gun was tested at that time. The invention was never publicly exhibited "and no one saw it besides the inventor and one or two other employees of the Winchester Company." After being tested, the "gun was stored in the model room of the same company until produced in the course of the trial." Under these circumstances, who was entitled to the patent—Mason, the first inventor, or Hepburn, the second inventor? The Patent Office decided that Hepburn's patent was good "on the ground that the invention by reason either of secretion or forgetfulness on the part of Mason had become, as it were, a lost art." The Court, however, refused to follow this decision, holding that it is necessary that the knowledge of the art or the improvement therein shall have completely disappeared. The Court then asked:

"The remaining question is, can the decision be upheld upon the ground that Mason's right to claim of priority has become barred by his designed or negligent concealment of his invention from the public and the subsequent entry of his rival in the apparently unoccupied field?" After then referring to *Kendall vs. Winsor*, the Court said:

"Considering, then, this paramount interest of the public in its bearing upon the question as presented here, we think it imperatively de-

mands that a subsequent inventor of a new and useful manufacture or improvement who had diligently pursued his labors to the procurement of a patent in good faith, and without any knowledge of the preceding discoveries of another shall, as against that other, *who has deliberately concealed the knowledge of his invention from the public*, be regarded as the real inventor, and as such entitled to his reward."

The Court also said:

"In some of the decisions the first inventor is regarded as having abandoned the field to other inventors, while in others he is held to have lost his right by sleeping too long upon it.

Strictly speaking, abandonment after the completion of an inventive act applies in a case where the right of the public to the use is involved and not in one where the contention is between rival claimants merely of the monopoly. The true ground of the doctrine, we apprehend, lies in the spirit and policy of the patent laws and in the nature of the equity that arises in favor of him who gives the public the benefit of the knowledge of his invention, who expends his time, labor, and money, in discovering, perfecting, and patenting in perfect good faith *that which he and all others have been led to believe has never been discovered* by reason of the indifference, supineness, or wilful act of one who may, in fact, have discovered it long before."

In the decision, reference is made to the case of *Mower vs. Crisp & Copeland*, 83 O. G. 155, decided by Commissioner Duell, a patent lawyer of high reputation, who subsequently became a member of the Court of Appeals. The point was correctly de-

did by Commissioner Duell. In that case it appears that Mower had constructed a full-sized machine, which was satisfactorily tested in 1882 and 1883, after which it was laid aside for some eleven years. In the meantime, Crisp and Copeland, conceived the same invention, reduced it to practice, applied for and obtained a patent and placed the invention upon a large scale on the market. It was not until the Crisp and Copeland patent had been issued for nearly three years and the machines had been placed upon the market for nearly two years in New England, where Mower lived, that the Mower application was filed. Under these circumstances, there could have been no other conclusion that, as between Mower and Crisp and Copeland, the former was the prior inventor and Commissioner Duell so decided. The Commissioner said, however:

"I am clearly of the opinion that Mower and his assignees, who are in no better position than he, were guilty of laches in putting aside the machine for some eleven years after it was perfected and tested, and that they are estopped by such laches from receiving a patent by reason of the entrance into the same field of rival inventors who reduced the invention to practice, obtained a patent, placed the invention upon the market, and gave to the world the knowledge and use of the invention, in return for which, I apprehend, is found the consideration which induced the framers of the Constitution to grant therein the power to Congress to promote the progress of science and useful arts by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries."

After then reviewing *Kendall vs. Winsor*, and other cases, denying to the first inventor who has deliberately concealed the invention the right to obtain a patent, the Commissioner said:

"Believing that the facts and the law applicable thereto warrant me in holding that Mower is not justly entitled to a patent, I direct the Primary Examiner at the close of the Interference proceedings, if priority shall be awarded to Mower by the final tribunal, to reject the claims of Mower involved in this interference."

It will be seen that the facts in *Mower vs. Crisp & Copeland* were identical with those in *Mason vs. Hepburn*. In each case, the first inventor had undoubtedly constructed a complete machine, the machine was then deliberately concealed for a long period of time, and was not used during such period, the second inventor independently made the invention during the period of concealment, applied for and secured a patent, and began to supply the invention to the public, and the first inventor, having knowledge of that fact, then applied for a patent. *Mower vs. Crisp & Copeland* was decided on March 25, 1898, by a lawyer who had made the study of patent law his life work, and *Mason vs. Hepburn* on June 7, 1898, by a new court, none of the three members of which was a patent lawyer or presumably familiar with the intricacies of that practice. Mr. Duell held that as between the first inventor and the second inventor, a valid patent could only be granted to the former, and that if his rights have become lost, they must have been abandoned to the public and can never be dedicated to any particular individual. The Court of Appeals held, however, on the same facts, that where the first inventor has abandoned the invention, that

abandonment could inure to the benefit of a later inventor. The Court of Appeals undoubtedly fell into a serious error on this point, but whether right or wrong, their decision dealt solely with the question of abandonment and not, as in the present case, with an invention which was never abandoned, but which has been continuously practiced ever since its inception, and the benefits of which have been continuously conferred on the public. The case of *Mower vs. Crisp & Copeland* does not appear to have been appealed, and the decision of Commissioner Duell awarding priority to Mower became final. Acting, however, upon the Commissioner's suggestion, Mower's application was rejected on the ground that the invention had been abandoned to the public and not, as the Court of Appeals believed could be done, to Crisp and Copeland. From this unfavorable decision the Mower application came before the Court of Appeals in *Mower vs. Duell*, 88 O. G. 191, where it was urged in support of Mower's claim to a patent that having been adjudged by the Patent Office to be the first and original inventor, abandonment of his rights to the public could not be presumed by mere delay in applying for a patent or concealment of the machine. The Court, however, said:

"But it has been earnestly argued for the appellant that by Section 4886, United States Revised Statutes, there can be no abandonment of the right to a patent unless such abandonment is affirmatively proved and that there is no such proof in this case and that unless the right be abandoned neither the Patent Office nor the Courts can withhold the patent from the original or first inventor. *This, as a general proposition, may well be conceded; but the question as to the proof of abandonment is*

quite another thing. Affirmative facts may be proved by negative evidence, and where the acts and conduct of a party are of such nature as to give rise to a rational presumption of a fact, that presumption, after the rights of other parties have intervened and attached, cannot be removed and gotten rid of by simply denying the intention to produce the result. Parties must be bound by the consequences of their own acts, and this principle is true in the patent law as it is in all other departments of the law. *A deliberate intentional delay and non-action* in a matter of either a public or private concern is proof of a very cogent nature, and the party chargeable with such conduct must bear the consequences of it and will not be heard to excuse himself by simply declaring that he did not intend to prejudice the rights of others or to waive rights of his own that would have been available to him if they had been timely exercised. The doctrine of equitable estoppel applies in the administration of the patent law as it does in other cases for the prevention of injustice."

(b) In *Warner vs. Smith*, 84 O. G. 311, referred to in Complainant's main brief, (pp. 55-56) and decided on the same day as *Mason vs. Hepburn*, the facts were quite different. In that case, both parties were applicants, Warner having filed his application on January 4, 1895, and Smith on October 15, 1895. The invention in issue related to improvements in buttons and on behalf of Smith it was shown "that he had made one full-sized button about January, 1892, but put it aside and never made any use of it and never followed up the invention in any way until Warner had come into the Patent Office." Under these circumstances, the Court of Appeals said:

"Can one who has made an invention and *who has locked it up in the secrets of his own exclusive knowledge* and who produces it only when some rival inventor has entered the field, be held to have acted in accordance with the policy of the law or with the spirit and purpose of the Constitutional provision? Such action, or inaction, as we might more properly term it, not only contravenes the interests of the public, but also operates to injure the rival inventor who, in the meantime, enters the field of invention *upon the faith of the conditions as they appear to exist*, and upon which he is entitled to rely."

Giving only so much of an extract from the decision, the impression might be drawn, that any delay, however short, and any concealment, however effective, on the part of the first inventor, must conclusively deprive him of the right of the patent as against a later but more diligent inventor. But complainant failed to continue quoting from the decision of the Court, which we now do:

"Such rival inventor expends his time, his efforts, and his money in the elaboration of his conception *in ignorance of the fact that any one else has been in the same field before him*, and he goes into the Patent Office only to be confronted after several months of effort there with the claim of some one else, who then comes forward *for the first time and alleges that he had the same invention long before*. Probably such claimant is not barred by any statute from making his claim, and if he sufficiently proves it he and not his competitor will be entitled to the patent, for it is to the first inventor, the first to conceive and to reduce into practice, that the law awards priority. But such condi-

tions make it imperative upon him that he should prove his claim beyond all reasonable doubt, and the Patent Office and the courts are justified in *presuming in such cases that what is claimed to be reduction to practice is no more than mere experiment until the contrary is clearly shown.*"

(c) In *McBerty vs. Cook*, 90 O. G., 2,295, decided February 13, 1900, the invention was reduced to practice by McBerty in 1891 or 1892, tested at the time, and the application was not filed until July 29, 1896, Cook, the second inventor in the meantime having applied for, and obtained, his patent. There was, however, no proof of an attempt to deliberately suppress the invention. For this reason the Court refused to follow the rule of *Mason vs. Hepburn* and said that:

"that rule will not be extended to any case not coming clearly within it."

(d) In *Fefel vs. Stocker*, (94 O. G. 433) decided by the Court of Appeals, December 11, 1900, Fefel was the patentee, whose patent was issued December 14, 1897, on an application filed January 14, 1897. Stocker's application was not filed until June 4, 1898, but he relied for a reduction to practice on a machine constructed in March, 1894, and which was operated between the summer of 1894 and February, 1895. The Court, however, specifically found that this was merely *an abandonment experiment* and said:

"It is conceded that the machine, as it now exists, was satisfactorily operated before the Examiner of interferences in the Patent Office; but it is not sufficiently shown that it was satisfactorily operated by Stocker when it came

to him from the hands of Weiss Brothers. Moreover, *its apparent abandonment* by Stocker and the long and wholly unexplained delay of more than four years in the application for a patent, are strongly indicative of the fact that the original machine of Stocker *was not a successful reduction to practice*, and was not more than *an abandoned experiment*. Long and unexplained delay in the application for the patent is always significant in such cases, especially when as here, the parties in interest were actively engaged in the prosecution of other similar applications; and such delay *raises a presumption which it is incumbent on the applicant to rebut* by clear and satisfactory proof."

The decision might well have rested on this general proposition and when so considered, there could have been no possible ground for criticising it. But the Court in affirming the doctrine of *Mason vs. Hepburn*, said:

"But it harms no meritorious inventor, and it is greatly to the interest of the public that long delay unexplained between the time of the alleged invention and the application for patent, when other inventors have entered the same field and other rights have accrued, should be held to bar stale claims of priority. *A stale claim should be fortified by the very strongest and most satisfactory proof before it can be allowed to overthrow the rested right of a patent already issued.* There is sometimes a tendency to hold back applications for patents in order to circumvent rival claimants, and to prolong the life of the monopolies previously granted; but it is a tendency which should be rebuked whenever it is possible to do so."

In other words, the Court held that the Stocker machine constructed and tested less than three years before Fefel's application might be a complete embodiment of Fefel's patented invention and might have been known to scores of persons, yet, if deliberately concealed from the general public, its prior knowledge and use would not, in their opinion, prevent Fefel from securing a valid patent, or invalidate the patent if granted. *Fefel vs. Stocker* is susceptible to the criticisms of *Mason vs. Hepburn*, and can only be reconciled with the statutory limitations as to inventorship and novelty upon the assumption that the original machine constructed by the prior inventor was an abandoned experiment.

(e) In *Reichenbach vs. Kelley*, 94 O. G., 1,185, decided by the Court of Appeals on January 8, 1901, Reichenbach's patent was granted February 22, 1898, and the application was filed April 1, 1897; Kelley's application was filed April 11, 1898. Kelley constructed a machine embodying the issue in December, 1894, which was operated the following month. On May 1, 1895, the machine was shipped to London, and therefore so far as prior knowledge and use in this country are concerned, it was as effectively concealed as if stored in a warehouse. The Commissioner of Patents decided that while Kelley was entitled to award of priority over Reichenbach, a patent could not be granted to him because of the long delay in making application therefor. The Court had before them all the facts of *Mason vs. Hepburn*, but they refused to apply that doctrine and decided the case on the ground that Kelley's work must be regarded as an abandoned experiment. The Court said:

"After careful consideration of the facts of this case and the law in application thereto, our conclusion is: that the single test of the ma-

chine, confessedly made by Kelley, the shipment to England and omission of evidence respecting its use or operation there, the failure of any of the parties concerned to make another machine to supply the growing demand in this country for long pieces of the film and the failure to apply for a patent until after the publication of that issue to Reichenbach, tend to show, not the wilful secretion or abandonment of a complete invention, *but rather the failure of an attempt to reduce the conception of a valuable invention to practice and the abandonment of further experiments in that direction.*"

(f) In *Thomson vs. Weston*, 99 O. G., 864, decided March 4, 1902, Weston's patent was granted March 22, 1898, and Thomson's application was filed June 21, 1898, after the issue of his rival's patent had been brought to Thomson's attention. A complete device embodying the invention was constructed by or for Thomson shortly before August 6, 1894, and was used in his private workshop, its construction being known only to Thomson and his assistant Shand. Apparently Thomson did not attach sufficient importance to the device to apply for a patent, and he believed that it was not patentable. According to the Court he "deliberately concealed the invention from the public until another had patented the device and put it into extensive use." The Court in applying to this situation the doctrine of *Mason vs. Hepburn*, said:

"It is true that the time of concealment in this case was something less than four years as against seven years in that. The mere difference in time, however, is not sufficient to affect the application of the principle, for it is as certain in one case as in the other that the

application for the patent was *solely stimulated* by the publication of the patent granted to another inventor."

And again:

"What was said in *McBerty vs. Cook supra*, and has been referred to on behalf of the appellant, namely, that 'the rule will not be extended to any case not coming clearly within it,' was not to impair its force, *but to recall attention to the restricted field of its application.*

The particular object of the beneficence of the patent law is the individual who first conceives and with diligence perfects an invention. And where one has completed the act of invention, his right to the reward in the form of a patent becomes complete, save in two instances that may be satisfactorily shown to exist. First, he loses the right as against the public in general by a public use for the statutory period. Second, by deliberate concealment or suppression of the knowledge of his invention he subordinates his claim in accordance with the general policy of the law in the promotion of the public interest, to that of another and bona fide inventor who during the period of *inaction* and concealment shall have given the benefit of the discovery to the public."

(g) In *Matthes vs. Burt*, 114 O.G., 764, referred to complainant's main brief, (pp. 58-59) and of special interest because the invention related to a factory apparatus the product of which was to be sold to the public, it appears that both parties were applicants, Burt having filed in December, 1901, and Matthes in February, 1902. The facts stated by the Court in connection with the work of Matthes, were the following:

"We will assume, therefore, as found by the Commissioner and the other tribunals that Matthes made a full-size operative model and tested it in June, 1898, to his own complete satisfaction, as well as that of the officers of the Brunswick-Balke-Collender Company, by whom he was employed. The mold thus made and tested was kept in the factory where it was concealed from the public and known only to two or three employees, who had helped to operate it. Some of the balls of this *experimental* manufacture were sold with the general stock, but it was admitted that there was nothing in their appearance to distinguish them from balls made in the old way; and no record of them was kept and no attempt made to determine how they might bear the strain of common use in comparison with the other balls, which was a thing that Matthes seems to have regarded as uncertain. Instead of proceeding to make balls for the trade with the newly invented mold, *it was laid aside and the manufacture was continued in the old way.* Notwithstanding he had caused search to be made in the Patent Office in 1899 and discovered that there was, apparently, nothing in the way of securing a patent for his invention, Matthes filed no application until February, 1902, some time after he had acquired knowledge that Burt was manufacturing and selling to the trade balls made with a similar device. During this interval of more than three and a half years, the public had no means of acquiring knowledge of his invention."

Burt, on the other hand, had independently made the invention and as early as August, 1901, had constructed a mold with which he began to manufacture thousands of the balls which were sold. It

will be seen that the facts in *Matthes vs. Burt* are in no sense comparable with the situation presented by the present case, even if we concede to Macdonald the position of an independent inventor. The Court particularly emphasized the fact that after Matthes had made the invention, *he laid it aside and returned to the old construction*. It is perfectly clear that if Matthes after making the mold, had continuously used it and sold the product to the public, his position would have been completely changed, and there seems to be no reason to doubt that this would be so, whether the mold was operated in the front window of the factory, where it could be seen and examined by every passer-by, or whether operated within the factory by the proper workmen who may or may not have been enjoined not to disclose the invention to the public. Plainly, the work of Matthes had all the ear-marks of an unsuccessful and abandoned experiment. Defendant's position would be analogous to that of Matthes, if after the invention of the complete recording composition by Aylsworth in 1898, *defendant had returned to the manufacture of the original ceresin blanks* and did not take up the perfected metallic soap composition until it had been developed independently by McDonald. With the special facts before them, the Court of Appeals said:

"Having then completed the invention and satisfied himself of its utility as claimed, Matthes *deliberately concealed it, suppressing its use* and withholding it from the public. How long he might have pursued this policy with no rival in the field, is of course conjectural; but it is certain that he showed no substantial intention of change of policy until he had obtained definite knowledge of Burt's exploitation of the same invention. On the other hand, Burt having no knowledge of Matthes discov-

ery and encouraged and induced by the apparently unoccupied field, went diligently to work to perfect his invention and to put its product upon the market. He not only sold this product to the trade in large quantities, but promptly applied for a patent. On this state of fact the Commissioner held that Matthes' right had become subordinate to that of Burt, who was the first to invent in accordance with 'the true policy and ends of the patent laws' as declared by the Supreme Court of the United States in *Kendall vs. Winsor*."

(h) In *Sarfert vs. Meyer*, 101 O. G., 2,286, Meyer had obtained a patent on January 16th, 1900, and Sarfert's application was filed March 10, 1900. The Commissioner found that Sarfert had reduced the invention to practice in March, 1898, a year before Meyer's application was filed. He says:

"It follows that he (Sarfert) is entitled to a patent unless his conduct during the years 1898, 1899, and up to March, 1900, when he applied for a patent, were such as to estop him from asserting his claim to the invention under the rule announced in *Mason vs. Hepburn*."

It appears that Sarfert's machine "was used under cover and secretly;" that "Clark was employed to operate it *under injunction to secrecy*, and then Murray and Kent were also employed on it in a locked room, the windows of which were painted," and that "Sarfert *was anxious to keep this a secret*, because it was 'an invention which nobody had and everybody was after the finish that he was doing on his machine.'" The Commissioner held:

"These facts are not such as will bring Sarfert's case within the rule announced in *Mason vs. Hepburn*. Sarfert, after the reduction to practice of his invention, *did not deliberately lay the same aside*, nor did he conceal it from the public."

(i) In *Oliver vs. Felbel*, 100 O. G., 2,384, the Court of Appeals, as in *McBerty vs. Cook*, *supra*, reiterated the point that the rule of *Mason vs. Hepburn* was to be applied only to cases coming clearly within its scope. Oliver filed his application on July 7, 1899, and "since June 1, 1899, large numbers of such machines have been manufactured and sold." Felbel did not apply for a patent until December 18, 1899, more than six months after Oliver had commenced to manufacture and sell machines to the public. Felbel, however, constructed a complete machine on or about July 20, 1898, which was thereafter successfully operated. Felbel's work was in a sense, therefore, analogous to the position of defendant herein, yet the effort was made to deny to him the right of inventorship for the reason that he "was not diligent in coming to the Patent Office with an application, or in putting the invention on the market, and that in the meantime, Oliver did put the invention on the market and promptly applied to the Patent Office for a patent." The Court said:

"There was here no fraudulent concealment, no suppression of the invention to keep it from the public, no abandonment of it, *as of an unsuccessful experiment*, no such unreasonable delay as to impose upon the claimant the burden of proof beyond a reasonable doubt. * * * The diligence required of an inventor is *diligence rather in the reduction of his invention to practice* than in application to the Patent

Office, or in manufacturing his device for public use. It is very true, as we held in *Mason vs. Hepburn*, *Warner vs. Smith*, and other cases, that delay, long and unexplained, and yielding to activity only when the knowledge comes of the entrance of a rival on the field, is *always presumptive evidence that what is claimed to have been reduction to practice was no more in fact than an unsatisfactory or abandoned experiment*. But when reduction to practice has been satisfactorily shown, and there is no unreasonable or unexplained delay, there is no law that will bar the first or original inventor of his right. In order to give to delay the effect of destroying such a right, there must be some circumstance of *concealment, suppression, or abandonment of the invention.*"

(j) In *Rolfe vs. Hoffman*, 121 O. G., 1350, decided December 5, 1905, the Court again refused to extend the doctrine beyond its narrow compass. It is interesting to note that in this case the decision was written by Mr. Justice Duell, who had previously held the office of Commissioner of Patents. Here Hoffman filed his application on January 19, 1903, and the patent was granted on November 17, 1903; Rolfe's application was filed December 29, 1903, but the evidence showed that he had reduced the invention to practice in December, 1901. The Court said that:

"The doctrine enunciated by this Court in *Mason vs. Hepburn* and *Warner vs. Smith*, was based upon the facts disclosed by the records in those cases, and the rule there laid down will not be extended to any case not coming clearly within it."

(k) In *Bliss vs. McElroy*, 128 O. G., 458, decided February 5, 1907, McElroy's application was filed September 9, 1901, and the patent issued February 17, 1903. The Bliss application was not filed until September 10, 1904; sometime in June, 1897, Bliss reduced the invention to practice and tested the apparatus in the presence of three witnesses. *Nothing further was done with the invention until the application was filed, but on the contrary Bliss directed all of his efforts to the development of other inventions for the same purpose.* After referring to the decisions in *Mason vs. Hepburn*, *Thomson vs. Weston* and *Matthes vs. Burt*, the Court said:

"The conclusion is irresistible that Mr. Bliss set his system to one side because he believed he could invent a better one. It is equally clear that, having invented what in his opinion was a better system, he permitted this one to remain to one side until others after independent and patient efforts had conceived and developed similar systems. Then to clear the field of troublesome competition, he sought a patent. The patent laws were not enacted for any such purpose. They were not enacted to discourage but to stimulate invention, and, as was pointed out in *Mason vs. Hepburn*, the object of the Government in fostering inventions, is to benefit the public. The public receives no benefit from an invention that is locked up in a cupboard, or exists only in the brain of the inventor."

(l) In *Richards vs. Burkholder*, 128 O. G., 2,533, decided May 7, 1907, the rule in *Mason vs. Hepburn* as it had been evolved during the preceding nine years, was thus stated:

"If there be concealment, or suppression of the invention, the field lies open to be occupied by a more diligent, though later inventor, who, when he has not only put the invention into public use, but has also obtained a patent for it, cannot be divested of his right to hold the field, except upon proof beyond a reasonable doubt that the earlier and more negligent inventor has not gone back to an abandoned device or a device suppressed or concealed, in order to establish a prior right."

(m) The case of *Burson vs. Vogel*, 131 O. G., 942, decided April 2, 1907, is of special interest because the Court made it plain *that continued factory operations cannot be regarded as efforts to conceal or suppress an invention*. In that case, Vogel's application was filed May 28, 1902, and Burson's on April 17, 1903. Burson constructed a singeing machine embodying the issue in December, 1900, and tested it in January, 1901. There was some doubt whether this machine was a complete reduction to practice, but the Court held that although crude, it embodied the invention. On the subject of Burson's delay in filing an application, the Court said:

"There was very great delay on the part of Burson in filing his application for a patent, but it does not appear that he suppressed or intended to conceal knowledge of his invention after its reduction to practice. The Burson Knitting Company was engaged in the manufacture of stockings and other knit goods on a large scale and used the stripping machines in the course thereof. Burson testified that it was the policy of the Company not to patent machines used in work in its own factory. This is perhaps not an unusual practice on the part

of manufacturers of products by the use of machine. *Whether so or not, it does not amount to such a concealment of the invention after reduction to practice as to subordinate his right to a later discoverer under the rule governing in Mason vs. Hepburn.* * * * * Whether Burson's use of his machine in his factory for more than two years before applying for a patent amounted to such public use within the meaning of Section 4886, Revised Statutes, as to bar his right to a patent is not a question which can be raised in this case, which involves priority of invention as between him and Vogel."

From this review of the case of *Mason vs. Hepburn* and those decisions of the Court of Appeals which followed it, the following points are clearly present:

(1) The doctrine is applied only in cases of interference between rival inventors and has no application to a situation where prior use and prior knowledge are relied upon as defences under a patent granted to one who is not the prior inventor.

(2) The doctrine is only applicable in those cases where the first inventor having made the invention deliberately concealed and suppressed it and revived his interest in it only when spurred into activity by the appearance of his rival on the field. If to be justified at all, the work of the first inventor must be regarded as an abandoned experiment.

(3) In no case has the doctrine been applied to a situation in which the first inventor continuously practiced the invention and sold the product openly.

(4) There can be no concealment or suppression of the invention when the latter involves a factory apparatus or machine, providing the product is

manufactured and sold, (*Matthes vs. Burt*, and *Burson vs. Vogel, supra*), and this is true even when the machine is operated under injunctions as to secrecy (*Sarfert vs. Meyer, supra*). There would seem to be no logical distinction between a factory apparatus and a factory process, since in each case the product is the thing that the public buys.

(5) The doctrine has never been extended to any case not coming clearly within its scope and involving the two considerations, first, that the prior inventor deliberately and intentionally withheld the invention from the public and neither sold specimens thereof nor specimens of a product obtained therefrom, and second, that the first inventor was spurred into activity and sought to obtain a patent only after knowing of his rival's patent or of his rival's commercial operations. From these facts it will be clear to the court, that if defendant had not been barred by two years' public use of the invention at the date of Macdonald's patent, the question of priority of invention could have been litigated and would inevitably have resulted favorably to defendant, since its use of the invention was continuous and had never been abandoned. Defendant being barred at the date of Macdonald's patent from questioning priority of invention, can only rely upon its prior knowledge and use as defenses under the patent granted to one who is not the first inventor and who seeks to enjoin the continuance of operations commenced many years before his invention was made, if at all, and which have been continuously practiced ever since.

While prior knowledge and use in connection with factory operations practiced in secret and withheld from the public, must under the Statute invalidate a patent to a later, though independent, inventor, it has been suggested that a secret use by the inventor may not be such a public use as to bar the grant to him of a valid patent.

The Court will bear in mind the distinction between *prior knowledge and use* on the part of others than the patentee, and urged as a defence of lack of novelty; and *public* use by the inventor for more than two years prior to his application, which use is made an absolute bar under the Statute.

The first defense attacks the novelty of the invention and asserts that the patentee was not the "first and original inventor," but that the invention in fact, was known to others and used before his invention. If known and used by others in this country, it can obviously make no difference whether the knowledge is possessed by many or by a few, whether the use is extensive or limited, whether that use is carried on in a factory under injunction of secrecy or otherwise. These limitations have no relation to the main question, that the patentee is not the first and original inventor and is not entitled to a monopoly on an invention known and used by others in this country before his invention.

The second defence is essentially drastic, and admits of no exception; if an inventor publicly uses or sells his invention for more than two years before applying for a patent, he forfeits his right to a patent. The Courts whenever possible have sought to avoid the harsh consequences of this defence, and hence in many cases where the use has apparently

been in public, it has been held to be experimental, and in other cases the experimental character of a use has been inferred from the fact that efforts were made to preserve it a secret. The general doctrine apparently arose under the Statute of 1836, *where any public use whatever*, with the consent of the inventor prior to the application, was fatal; but with the Statute of 1870, giving a period of two years for public use and sale, there seems to be but little necessity for the rule.

Curtis on Patents, 1867, in Section 389, refers to the practice under the old Statute:

"Where a party practices his invention himself for the purposes of experiment or completion, before he takes out a patent, the inference that he intends to surrender his invention to the public does not arise; and, consequently, a dedication cannot be proved by evidence that shows only experimental practice by the inventor, whether in public or in private."

And again, Curtis in Section 391, says:

"Another instance of a use, which will not expose the patentee to the consequences of this defence, is that suggested on more than one occasion by Mr. Justice Story, where the use has been permitted to others, for other limited purposes than those of experiment or completion, *as from motives of neighborly kindness*, and the like. * * * * If a patentee could show clearly that he had allowed to others a limited use of his invention, not for his own profit, but for their accommodation, in a manner consistent with a clear intention to hold the exclusive privilege, and the invention had not got beyond his control, with his apparent acquiescence, he would not be within the mischief of this part of the Statute."

And the text-writer in Section 391-a refers to "the very recent case of *Kendall vs. Winsor*." It is a curious fact that in *Kendall vs. Winsor*, although the complainant's machines were extensively used in his factory for the manufacture of harness, several years before the application was filed, the fact that such use might be a public use under the Statute never seems to have occurred to the Court. Being a secret use, they refused to apply the statutory bar, but instead, decided that because of such secret use the patent could not be invoked to prevent defendant's operations commenced during the period of concealment.

The idea that a use in secret may avoid the harshness of the public use provision, occurs in numerous decisions of the Courts:

In *Manning vs. Cape Ann Isinglass Co.*, 108 U. S. 462, it was urged that the use by the patentee was a secret use and not a public use. The Court said:

"But we think the testimony shows a use open to the public generally. But whether this be so or not is immaterial, for Norwood and his son were allowed by the inventor the unrestricted use of the patent during the period mentioned, *without injunction of secrecy or other condition*. This is sufficient to constitute a public use."

In *Egbert vs. Lippmann*, 104 U. S. 333, the patented corset steel was used only by the wife of the patentee, who was apparently justified in asserting with great positiveness that the use was not a public use, but was a secret or experimental use. The Court, however, said:

"We observe in the first place that to constitute the public use of a patent, it is not necessary that more than one of the patented articles should be publicly used. * * * *

We remark, secondly, that whether the use of an invention is public or private, does not necessarily depend upon the number of persons to whom its use is known. If an inventor, having made his device, gives or sells it to another, to be used by the donee or vendee, without limitation or restriction, or *injunction of secrecy*, and it is so used, such use is public, within the meaning of the Statute, *even though the use and knowledge of the use may be confined to one person.*"

In *Perkins vs. Nashua Card Co.*, 2 Fed. 451, decided by Judge Lowell, the same effort was made to avoid the statutory bar by asserting the use to be secret and not public. The Court said:

"There was no pledge of secrecy proved here, and there was some evidence that none was exacted from anybody. There was no evidence of concealment, except that the factory was not open to chance visitors. It was understood I suppose, as most factories are conducted with no intention of divulging any secrets, and none to have curious and prying persons admitted; but without any special precaution beyond what prudent men, who do not care to be interrupted in their business, would usually adopt. For my own part I should have some doubt whether a pledge of secrecy, exacted of a number of workmen who had nothing to do with the machine in question, and had opportunity to examine it if they chose, would make the use a secret one."

Apparently, the efforts made by defendants in that case to keep the invention a factory secret, were very closely related to those adopted by defendant in this case. The Court decided the use was a public use, which barred the patent, as of course, would have been the case with defendants herein if they had attempted to secure a patent more than two years after operations were commenced and the composition put on the market.

In *Lettelier vs. Mann*, 91 Fed. 917, where the same attempt was made to avoid the bar, the Court said:

"On this point, the law, as I understand it, is that where a machine is used for profit, not experiment, and particularly where it is exposed to the view of persons other than the inventor and his employes, *pledged or enjoined to secrecy*, such use is a public use."

See *Bryce vs. Seneca*, 140 Fed. 161.

Plainly in all of these cases the inference is clear that where a patentee more than two years prior to his application, practices his invention in secret and not openly, the use will be considered merely experimental and not public use. But it is equally clear, that if the inventor under the guise of secrecy, practices his invention for profit, and continues to do so for years, he runs the risk of losing all right to a patent, and will be held to have abandoned the invention to the public.

CONCLUSION.

From what has been said, the following general propositions seem to be established.

(1) The patent statutes require without qualification or exception that an invention to be patentable must be the creation of the first and original inventor and that it must not have been known or used by others in this country prior to the inventive act. The inventive act must be complete and nothing must be left for speculation or discovery. An inventor as so defined can never lose his status as such. Aylsworth was undoubtedly the first and original inventor of the composition and process here involved.

(2) An inventor may lose his right to a patent by abandonment to the public, either by express declaration, by relinquishing all interest or thought in the invention or by deliberate and intentional concealment or suppression. He can, however, never abandon or vest his title as the first and original inventor in favor of or in a second inventor. The latter is no more entitled to a monopoly than any other member of the general public.

(3) Under no circumstances can a second inventor be entitled to a valid patent, except possibly where the work of the first inventor has been not only abandoned but has been totally forgotten and practically becomes a "lost art."

(4) The second inventor does not become the first and original inventor merely because the first inventor neglects to apply for a patent, but elects to preserve the invention a factory secret. If the secret is discovered and disclosed to the public, it becomes public property, and not the individual and exclusive property of the later discoverer. He has

no status whatever in the patent law. ~~The confers~~ no greater benefit on the public than would the thief who deliberately stole the secret.

(5) The defence of prior knowledge and use has to do with the element of novelty, and if an invention is known to be *old*, the defence is established. The knowledge may be confined to workmen who practice the invention as a factory secret or the knowledge may be confined to special trades or localities. If prior knowledge is *proved*, a valid patent can never be granted to a later, though independent inventor.

(6) The bar of two years public use being in the nature of a forfeiture, the courts have intimated that where an inventor more than two years before application, practices the invention in secret, and not openly, such use will probably be considered a mere experimental use, and not a public use.

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Orange, N. J., April 25, 1908.